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Abstract

Indonesia is a very fertile agrarian country. Agriculture almost provides 40 per cent of jobs for the population. Ironically, agriculture is often identified with poverty. Farming is often engaged with underemployment and become the last employment option for the job seeker. On the other hand, the ever-increasing numbers of Indonesian demand on food should be a potential market for the agricultural industry. However, domestic production and supply are often inadequate, forcing the government to import. The government is very vigorous in the construction of various infrastructure to support the development of agricultural field. Starting from the construction of supporting physical facilities such as irrigation to various training programs and capital. Therefore, this study will analyse the impact of various rural development programs that the Indonesian government has made on agricultural production in Indonesia. This study used two types of control variables to control the impact of the infrastructure development program. The first type is derived from the characteristics of farmers such as, various demographic characteristics and risk behaviour. Second is the control variable derived from the natural state such as geography and weather characteristics. The analysis used is panel data regression analysis on IFLS data. Based on the results of the analysis, we find that there is not enough solid evidence that various government programs are able to increase agricultural production. However, other results indicate that there is a tendency for people not to move to urban areas compared to before the program. This indicates a future opportunity to improve and resume various programs that have been implemented.

Keywords: impact evaluation, agriculture, development program, IFLS, regression

Introduction

Indonesia is a very fertile agrarian country. Agriculture almost provides 40 per cent of jobs for the population. Agriculture growth has a portion of about 13.56 percent of national economic growth. The portion is quite large to affect the change in economic growth significantly. But ironically agricultural business is often identified with poverty. Farmer often becomes last employment option for the job seekers.

Agriculture sector is deemed incapable of providing livelihoods, as is the case with existing industrial sector in urban areas. This then became one of the reasons for the migration of villagers to cities, from agricultural sector to industri-

al sector. Hetler (1989) states that with one family member working in the city, the household can change its economic level from poor to middle level. Maning and Pratomo (2013) also stated that the migrant population from the village first entered the informal business field in the urban area but then many of them were able to enter the formal business field, that successfully improve the family's economy.

On the other hand, the ever-increasing number of Indonesians needs enormous food that should be a potential market for the agricultural industry. But in fact domestic production and supply are often inadequate, forcing the government to import. The government is very

vigorous in the construction of various infrastructures to support the development of agricultural business. Providing incentives to rural communities to do the agricultural business and not leaving the village to look for new jobs in urban areas. Various infrastructure development and supporting programs such as; irrigation to various training and capital programs have been conducted by the government.

The dependence on imported agricultural products has reached a very alarming level. The flagship program of the Government of the Republic of Indonesia in 2014-2019 is economic development starting from rural areas, which means the development of agricultural business. In order to support the government program to build Indonesia from rural area, we then study on the evalua-

tion of development policies that have been done so far in the field of agricultural business.

The Data and Econometrics

Because of the focus of this research is the evaluation of infrastructure development program and financial aid program, the main data used in this research is micro data from Indonesian Family Life Survey (IFLS). The following is an explanation of IFLS data and econometric strategies for policy evaluation. IFLS data used in this study is from the fourth wave in 2007 and the fifth wave in 2014. IFLS data can be accessed via

<http://www.rand.org/labor/FLS/IFLS.html>. Variables and data used in this research are as follows:

Table 1. Variable on IFLS Data

No	Variable	IFLS Data	Data Level	Section
1	Agriculture income	Book 2	HH	UT
2	Irrigation development	Book 1A	CF	D, E (E10)
3	Financial institution / programe	Book 1B	CF	G
4	Migration	Book 3A	Individual	MG
5	Agriculture income	Book 3A	Individual	TK

Based on two IFLS waves, we are then compiled panel data of individual level and household level (HH). The reason for the use of panel data between two periods (IFLS 4 and 5) is that most of the infrastructure development to be evaluated is the development undertaken during 2007 and 2014. Individual level of panel data will merge the Individual Revenue data from farming (TK) with irrigation development (D, E) at the community level, with the presence of financial institutions

(G) also at the community level, and with migration decisions.

There are two econometric strategies used in this study, Instrumental Variable (IV), and Double-Difference (DD). The econometric strategies used in this study have been used in various impact evaluation literatures such as; Gertler et. Al, (2011), Khandker et al. Al, (2009), Angrist and Pischke (2009). The main strategy to be used in this study is DD, but specifically for the impact of the financial aid program will use IV. This

strategy is used because farmers in choosing to use financial aid programs are not random. The regression equation for DD is as follows:

$$y = \beta_0 + \delta_0 d2 + \beta_1 dT + \delta_1 d2 \cdot dT + Others$$

y = Desired results through Variable of Interest.

β_0 = Constants

δ_0 = After-Before effect on Control Sample.

δ_1 = Average Treatment Effect (ATE)

dT = Variable of Interest, 1= If there is an infrastructure development, 0= Others

d2 = Variable of Interest, 1= After treatment, 0=before treatment

Table 2 shows the number of funding developments in 2009-2013 for the 5 (five) programs, where the government allocates funds for supporting infrastructure development (Health Facilities, Education Facilities, Transportation, Sanitation, Agricultural Production and Agricultural Marketing) for villages through

Table 2. PNPM Mandiri Funding 2009-2013 (Million Rupiah)

PNPM	Year				
	2009	2010	2011	2012	2013
PNPM Pedesaan	7.885.900	9.685.750	8.234.300	8.020.100	7.806.250
PNPM Perkotaan	1.849.615	1.156.425	1.218.600	1.414.733	1.391.317
PNPM Daerah Tertinggal Khusus	119.750	11.375	-	-	-
PNPM Infrastruktur Pedesaan	800.000	425.000	480.600	150.000	150.000
PNPM Infrastruktur Sosial Ekonomi Wilayah	355.500	355.500	355.500	355.500	355.500
Total Kecamatan	11,010,765	11,634,050	10,289,000	9,940,333	9,703,067
% PNPM Pedesaan	71.62	83.25	80.03	80.68	80.45

PNPM Infrastructure Rural (PIIP) and PNPM Regional Socio-Economic Infrastructure with total funds issued until 2013 amounting to 2.005 trillion rupiah for 188 sub-districts through PIIP program and 1.777 trillion rupiah for 237 sub-districts through the PNPM program of Regional Social Economic Infrastructure.

With such large funds allocated, rural infrastructure development is expected to improve the performance of the village economy, so that villagers can be comfortable in terms of community services as well as basic facilities such as road access facilities, sanitation facilities, educational facilities, health facilities and others impacts on improving business performance in rural areas that impact on the expansion of employment so that villagers can be empowered more and can help the village economy which will help to reduce the poverty rate in the village, so that villagers no longer see the city as the only place of prosperity to be but the village can also be viewed as a welfare place.

Source: *Pelaksanaan PNPM Mandiri Pedesaan, 2013*

Total infrastructure that has been built up to the year 2013 is 38,539 units with the allocation of funds from the government through the Community Direct Assistance (Bantuan Langsung Masyarakat) of 6.034 trillion rupiah and the fund of village associations (swadaya masyarakat) amounted to 187.928 billion rupiah. Empowerment of rural communities from men, women and Poor Household Members (Anggota Rumah Tangga Miskin) to 44,467,075 people is empowered in village infrastructure development projects.

Through the publication of the *Kementrian Pekerjaan Umum dan Perumahan Rakyat*, through the PPIP and RIS-PNPM Program each program has handled 31,960 villages and 5,02 villages in terms of infrastructure development with details of the funds that have been conveyed during the period 2009-2013 as well as the *Kementrian Pekerjaan Umum dan Perumahan Rakyat* has informed the community and the stakeholders of the village (PPP) the results of the development of PPIP and RIS-PNPM programs and the community is expected to utilize and maintain the infrastructure already built, so that infrastructure can last long to spur the welfare of the villagers themselves.

The fifth IFLS, launched in 2014, discloses some data on rural development

programs. Below is a list of government projects listed in the IFLS.

Developments (since 2007): Dummy Variable, 1 = yes, 0 no progress

1. Open a new roads
2. Construction of new roads
3. Construction of new health facilities
4. Construction of new schools
5. Introduction of electricity
6. Phone recognition (land line)
7. The phone can first be used in the village
8. Internet (eg opening of the first internet store)
9. Construction of irrigation
10. Market construction
11. Other infrastructure development

In addition to data on the types of development programs IFLS also notes on how the Village Development Fund is allocated in the relevant fiscal year (2014). Here is the type of village development:

1. Village company
2. Physical program
3. Social programs
4. Community Service Program
5. PKK
6. Others

Summary data on Village Development Funds allocated in the relevant fiscal year (2014) and dummy data of displaced persons from village kota are presented in following Table 3.

Table 3. Summary of Migration and Logarithmic Variables Natural Village Development Funds

Variable	Obs	Mean	Std. Dev.	Min	Max
Migration to Urban	772	0.550518 1	0.4977639	0	1
Ln(Village Expenditure)	772	19.7895	2.434404	4.584968	23.02585
Ln(Village Revenue)	772	13.33188	6.405486	4.584968	20.72327
Ln(Village BUMDES Revenue)	772	14.28952	1.519252	13.74294	20.72327
Ln(Village Physical Prog.)	772	16.62712	1.723177	15.20181	20.72327
Ln(Village Social Prog.)	772	14.24769	1.97506	13.12236	20.72327

Impact of Financial Institutions and Village Development Programs

As has been disclosed in the research objectives that this study wants to know the impact of various government programs ranging from physical development to financial support to the development of the agricultural sector. Using the value data of the harvest (natural logarithm) as the dependent variable, the result of the OLS estimation is as shown in Table 4.

By using variables control of various characteristics of family workers in farming, it was found that the variable number of financial institutions and the average distance had a positive and sig-

nificant effect on the value of farmers' harvests. This indicates the positive impact of the delivery of various final aid programs channeled through various financial institutions. However, the results in Table 4 do not indicate any significant impact (only the PKK program) from various village assistance programs to support agricultural enterprises.

The Influence of Rural Development on the Probability of Population to Migrate

The results of estimates of various development programs especially those channeled through the villages, based on Table 4 have not shown the desired results.

	(1)	(2)	(3)
VARIABLES	bols	bols1	bols2
Number of Financial Institutions	0.122*** (0.0219)	0.107*** (0.0220)	0.0986* (0.0221)
Average distance between home and closest financial institutions	-0.0101 (0.00819)	-0.00827 (0.00827)	-0.011 (0.0083)
Various Variety of Village Development Program			
Ln(Vilage Exp.)			0.0402 (0.0181)
Ln(prog. Fisik)			0.115* (0.0321)
Ln(prog. Social)			0.0101 (0.0271)

Table 4. Estimated OLS Determinant ln (farmers harvest value)

Ln(prog. Pkk)			-0.0150 (0.0395)
Ln(Others prog.)			-0.0771*** (0.0288)
Farmer HH Characteristics	No	Yes	Yes
Constant	13.63*** (0.159)	12.32*** (0.635)	10.02*** (0.838)
Observations	1,843	1,792	1,792
R-squared	0.019	0.034	0.051

standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1 Therefore, in this research, it is also tried to see the impact of various programs on the tendency of the population to move / migrate out of rural areas. The results of estimates by regression and Probit and Logit are as follows:

Table 5. OLS Estimation of the Determinants To Move/migrate to Town

VARIABLES	(1) b_ols_r	(2) b_ols_ur
Dummy infrastructure development	-0.0409* (0.0248)	-0.0439* (0.0247)
Ln(village expenditure)		0.00153 (0.00453)
Ln(village revenue)		-0.00348* (0.00183)
Ln(village social prog.)		-0.0165** (0.00648)
Ln(village bumdes revenue)		0.0141 (0.00907)
Ln(village physical prog.)		0.0133* (0.00797)
Constant	0.121*** (0.0219)	0.0830 (0.220)
Control	No	Age, age2, educ, geographical Dummy
Observations	772	772
R-squared	0.004	0.021

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 6. Logit and Probit of the Determinant To Move/migrate to Town

VARIABLE	(3) b_logit_r	(4) b_logit_ur
Dummy infrastructure development	-0.458* (0.259)	-0.513* (0.265)
Ln(village expenditure)		0.0138 (0.0510)
Ln(village revenue)		-0.0422** (0.0211)
Ln(village social prog.)		-0.214** (0.0870)
Ln(village bumdes revenue)		0.188* (0.106)
Ln(village physical prog.)		0.153* (0.0836)
Constant	-1.982*** (0.205)	-2.323 (2.624)
Control	No	Age, age2, educ, geographical Dummy
Observations	772	772
R-squared		

Robust standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1

Table 4 shows the regression results with ols both with restricted and non restricted. Both models point to significant findings on infrastructure development that feeds on urbanization from rural to urban areas. Next use the probit and logit model as shown in Table 5. also found the existence of infrastructure development in a village causes the probability of the village community to move to the city, on average, reduced.

Conclusion

Based on econometric analysis that has been done can be drawn some conclusions about the findings of this research:

1. Infrastructure development has a significant negative effect on migration to urban areas, both in OLS and Logit models
2. Negative effects are also found on Social Programs, and Village income
3. Interestingly, BUMDES and physical programs have a positive effect

Suggestion

Based on the findings of this study, we can suggest that direct physical development programs undertaken for rural areas can be carried out or forwarded. However, although this study does not involve management variables and human resources managers, we can suggest that there should be improvements in the sector. The BUMDES variables and funding allocations to physical development that we have found have not been able to influence the population to move to the city or out of the agricultural field can be additional evidence to confirm the weakness of the country's direct development program.

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