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DANA DESA ON CLEAN WATER AND SANITATION ACCESS IN INDONESIA: DOES CASH-FOR-WORK (PKT) MATTER?

Abstract:

This paper estimates the impact of Dana Desa as a form of the community-driven development program (CDD) on clean water and sanitation improvement in Indonesia. The data used is Indonesian National Socioeconomic Survey (SUSENAS) from Statistics Indonesia (BPS) and the amount of Dana Desa's money transfer in districts level from Ministry of Village, Development of Disadvantaged Regions And Transmigration (KEMENDESA) in 2015. The baseline data used is SUSENAS in 2014, and SUSENAS in 2016 as the data of post-intervention. The study used is quantitative analysis named difference-in-difference estimation (DID) which compare the outcome before (2014) and after (2016) the program using fixed-effect regressions. The analysis involves 405 districts and 810 observations of rural area. The study aims to assess the impact of Dana Desa on clean water and sanitation. The findings show that Dana Desa gives a positive and significant impact on sanitation access and clean water access in the districts where more people are working in informal sectors. Because they have more time to participate on supporting the program by joining cash-for-work (Padat Karya Tunai). This research is important to evaluate Dana Desa program as the biggest CDD program under President Joko Widodo's era.

Keywords:

Dana Desa, Community-driven development, difference-in-difference, cash-for-work, community participation, rural area

JEL Classification: C10, C19, O22

1. Introduction

Dana Desa is community-driven development program which recently implemented in Indonesia. The program is started in 2014 under the development goals which initiated in Joko Widodo era. In this program, government provides unrestricted block grants for each village up to IDR 1 billion. Moreover, central government transfer the Dana Desa grants annually to all the villages (Hidayah, 2019). The amount of grants are varied in every village, depend on their geographical area, poverty rate and their village development index.

> *Based on Law No. 6/2014 concerning Villages, the amount of the Village Fund from the State Budget (APBN) is 10 percent calculated on the basis of the number of villages, and allocated by taking into consideration the population, poverty rate, total area, and geographic constraints, to improve the prosperity and equitable village development (as explained in Article 72 Verse 2 of the Village Law) (KOMPAK, 2018).*

One of issues addressed is improving clean water and sanitation access for people who live in rural area. Clean water and sanitation are one of principal concerns of the Indonesian government. As Indonesia has a Long-term Development Plan (2005-2025), which states that:

> *"Development and a clean water supply and sanitation will be addressed to fulfil basic social needs."*

It has been strengthened by the vision and mission of the Indonesia government under President Joko Widodo from 2014 to 2019 and named Nawacita. It states that:

> *"To improve the quality of people's lives and well-being in Indonesia. To improve peoples' productivity and competitiveness in the global market, Indonesia will develop and be resuscitated together with other Asian countries. In 2030, achieving the universal and prevalent access to safe and affordable clean water for all. In 2030, to improve the water quality by reducing the pollution, removing discharge and minimising material release and dangerous chemicals, reduce half the proportion of untreated wastewater and significantly increase recycling, as well as reuse of recycled goods that are globally safe".*

Dana Desa program allows society to participate on every process of program implementation. The various activities involve the community in implementing Dana Desa, such as (Hidayah, 2019):

1. Village makes a plan by undertaking regular meetings with the community
2. Working on the plan
3. Monitoring together
4. Evaluation meeting
5. PKT (cash for work program).

One of interesting activities from Dana Desa implementation is PKT (cash-for-work). This activity allows poor people to take a part of working on the infrastructure and get paid by the local government (Hidayah, 2019). Various commentators have hailed community participation as an essential component in the water and wastewater sectors (Tan et al., 2009). It is one of strategies from local government to eradicate poverty in rural area. Moreover, PKT gives mutual benefits for poor people and local government, as poor people

can make their living and local government has a successful Dana Desa implementation. Dana Desa allocates 30% of the funds for empowering society by means of PKT (Padat Karya Tunai).

This study aims to assess how will PKT programs work to improve clean water and sanitation access and how does Dana Desa implementation affect clean water and sanitation development.

2. Literature review

Dana Desa is one of community-driven development program in Indonesia which resulted infrastructure intervention and community empowerment. Rogers (2009) in Hidayah (2019) states that the complicated nature of infrastructure interventions calls for the formulation of a well-articulated programme theory or, more generally, for theory-based evaluations. Some theory-based impact evaluation of transport infrastructure projects is briefly discussed in some previous research (see, e.g., Broegaard et al. 2011; Rogers 2009; White 2009, 2011; Weiss 2001; Hansen 2010; Rogers 2007). By an impact assessment on Dana Desa program, the research means an ex-post analysis of the intervention (see, e.g., Haddad (2011); Hansen 2010; BenYishay and Tunstall 2011).

3. Methodology

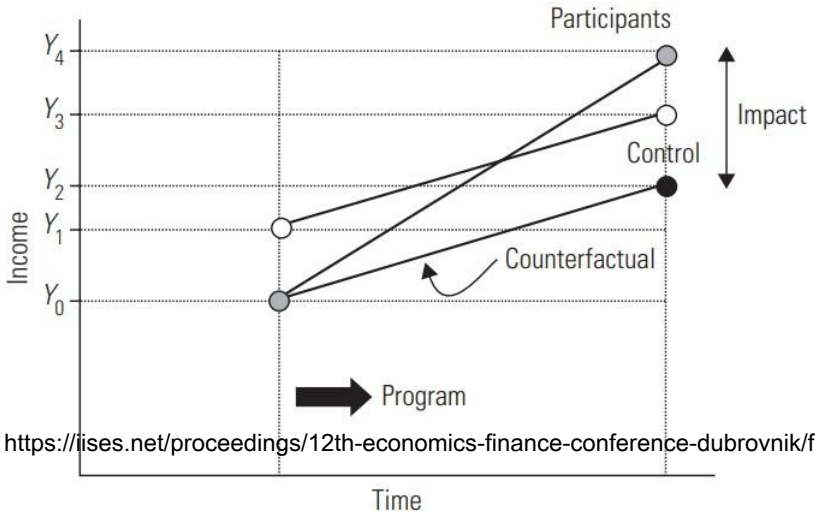
The study uses difference-in-difference estimation (DD) which compares the outcome before (2014) and after (2016) the programmes and using fixed-effect regressions. Thus, there are a two-period setting where t = 0 before the program and t = 1 after Dana Desa implementation, then Y_t^T and Y_t^C be the outcomes for beneficeries and nontreated units in time t. In estimates (1), $T_1 = 1$ denotes treatment at t = 1, whereas $T_1 = 0$ denotes untreated areas (see Figure 1). The DD's estimates can be writen as (Khandker, 2009) in Hidayah (2019):

$$DD = E(Y_1^T - Y_0^T \mid T_1 = 1) - E(Y_1^C - Y_0^C \mid T_1 = 0) \cdot \quad (1)$$

Dana Desa is a nationwide policy and program in which the entire population who live in villages will be beneficeries. There is no control variable; not all villages make the development of clean water and sanitation as their priority. Even when the program is not as far-reaching, if outcomes for participants are observed over several years, then structural changes in outcomes could be tested for (Ravallion 2008) in Hidayah (2019).

Figure 1. Impact Assesment

Source: Khandker, 2009 in Hidayah (2019)

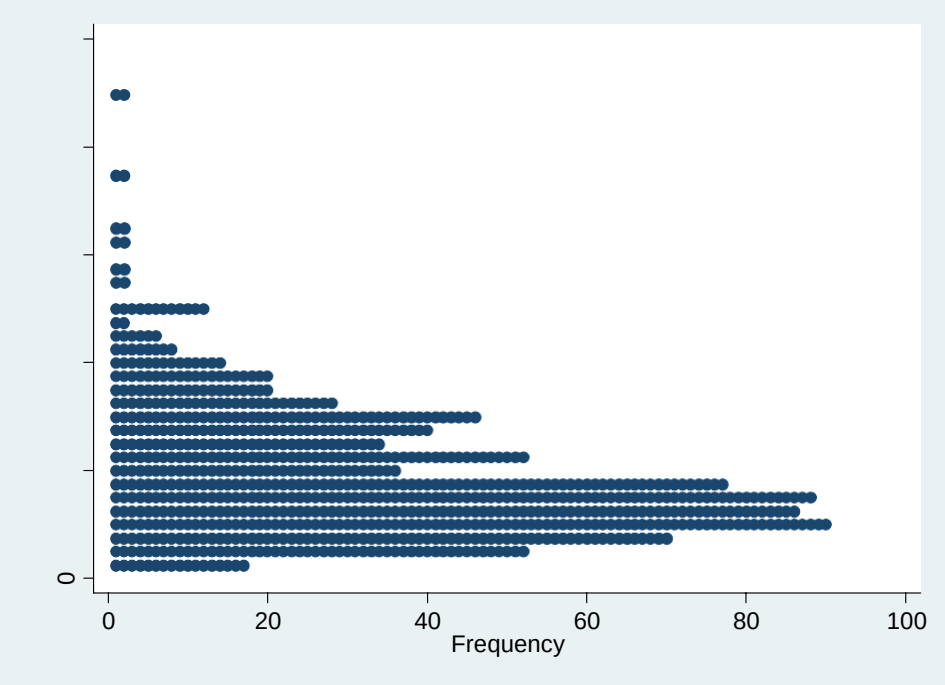


However, there is orbi-directional causality (White, 2010) that becomes one of the impact evaluation debates. It interprets as the selection bias and self-selection into the programme. It is important issue to consider in the design are the possibility of spillover effects (the control is affected by the intervention) and contagion or contamination (the control is affected by other interventions) (World Bank, 2002) in Hidayah (2019). For instance, there is a possibility that outcomes overlap for similar programmes in this study.

4. Data and Context

The study uses SUSENAS (Indonesian National Socioeconomic Survey) in 2014 and 2016. Moreover, this study use data of Dana Desa grants distribution in 2015 at district level based on Indonesian Ministry of Village database(see Figure 2). Most district get 4-5 (x10 billion IDR) grants allocation in 2015. There are 810 observation in this study.

Figure 2. Dana Desa Distribution (Kemendesa, 2018)



Source: Hidayah (2019)

Table 1. Dana Desa Allocation (SUSENAS 2014-2016)

LOCATION	FREQ	PERCENT	CUM.
NON-JAWA	652	80.49	80.49
JAWA	158	19.51	100.00

Source: Own calculation, 2019.

80.94 % of villages which involve in Dana Desa program are located outside Jawa islands. It means that most targeted areas are rural area which located far away from central government (see Table 1), such as: Kalimantan, Sumatera, Sulawesi, Maluku, Papua, Nusa

Tenggara and Bali. Moreover, 19.51% of targeted villages are located in Jawa islands, such as: Jawa Tengah, Jawa Timur, Jawa Barat and Yogyakarta.

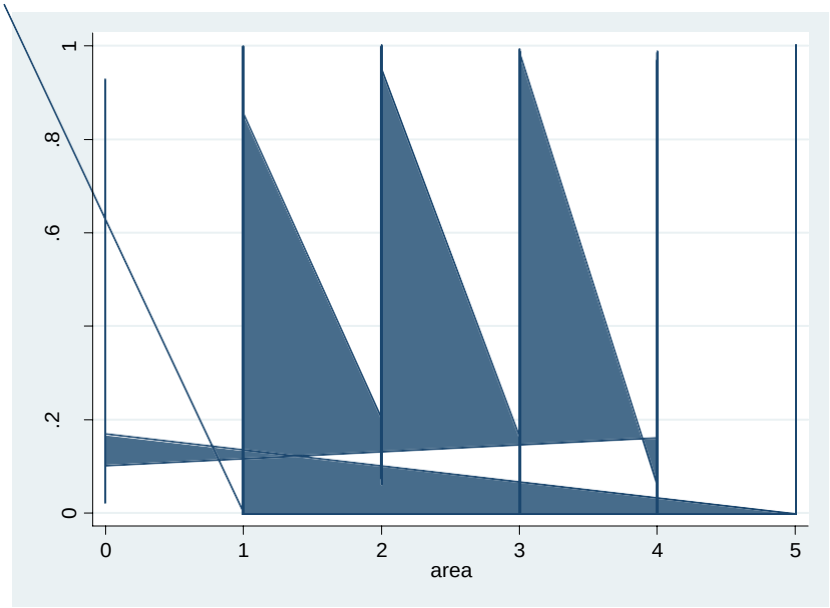
Table 2. Statistics Descriptive of rural area

	OBS	MEAN	STD. ERROR
HOUSEHOLD SIZE	810	3.723	1.187
INCOME SOURCE	405	1.108	0.350
ENERGY SOURCE	810	5.492	2.190
ELECTRICITY ACCESS	810	1.370	0.752
EDUCATIONAL ATTAINMENT	810	4.92	1.30
MARITAL STATUS	810	1.65	0.082
JOB POSITION	810	3.44	0.290
GENDER	810	1.49	0.01

Source: Own calculation, 2019.

In this study shows that the mean of household size is about 3.7. Then, most of their income source is internal income which means from the salary of family members. Most of household have access to gasses for cooking and have electricity access from National Electricity Company of Indonesia (PLN). More over in marital status part, most of observations have married. Based on Table 2, it shows that most people in rural area work in informal sectors.

Figure 3. Accessible Geographical condition



Source: Own Identification (2019)

Figure 3 shows the geographical condition in rural area which located in 5 area (code 1 to 5), which are: 1 is Sumatera, 2 is Jawa, 3 is Kalimantan, 4 is Sulawesi and Nusa Tenggara and 5 is Indonesia Timur (Maluku and Papua). Geographical condition in this study

analyse based on how good is their gasses and fuel energy, electricity access. This study assumes that better geographical conditions have better energy and electricity acces. It shows that the worst geographical condition is in Sumatera and Indonesia Timur.

6. Result and Discussion

Social Economics Condition

This chapter would like to analyse the impact of PKT program as a part of Dana Desa on the development of clean water and sanitation. Table 3 describes that most of households in rural area have income from external, such as from their investment's devident and charity. Then, Table 4 shows that most of households have had access to electricity, whether from public company or private company. However, there are still some household who do not have access to electricity, it means that their areas have not had electricity plant which might caused by their poor infrastructure.

Table 3. Income Source in rural area

INCOME CATEGORT	FREQ	PERCENT	CUM.
OTHER INCOME	388	47.90	47.90
INTERNAL INCOME	9	1.11	49.01
EXTERNAL INCOME	413	50.99	100.00

Source: Own calculation, 2019.

Table 4. Electricity Access in rural area

ELECTRICITY ACCESS	FREQ	PERCENT	CUM.
WITH ELECTRICITY	730	90.12	90.12
WITHOUT ELECTRICITY	80	9.88	100.00

Source: Own calculation, 2019.

Table 5 shows the difference between family who have up to 4 family members and more than 4 family members. There are 66.79% of households who have up to 4 family members. Mostly, a household consist of parent and children. Then, educational attainment is divided into 2 categories, namely: elementary school and highschool. It shows that there are 66% of population in rural area only finished their elementary school (about 6 years of educational attainment). Thus, the educational level is so low in rural area (see Table 6).

Table 5. Household size in rural area

HOUSEHOLD SIZE CATEGORY	FREQ	PERCENT	CUM.
0-4	541	66.79	66.79
MORE THAN 4	269	33.21	100.00

Source: Own calculation, 2019.

Table 6. Educational Attainment in rural area

EDUCATIONAL ATTAINMENT	FREQ	PERCENT	CUM.
ELEMENTARY SCHOOL	441	54.44	54.44
HIGHSCHOOL	369	45.56	100.00

Source: Own calculation, 2019

Dana Desa Program

The government claimed that they have physical outcomes from village funds program. Since 2015, Indonesian government allocates their direct investment to village level. The recapitulation of village fund utilization during 2015-2017 (Sandjojo, 2017) is below:

Figure 3. Dana Desa's output

Source: Kemendesa, 2018 in Hidayah (2019).

Based on the illustration above, the output is on economic development and livelihood improvement. The study focuses on livelihood quality based on clean water supply and sanitation. To develop livelihood quality some clean water and sanitation infrastructures have been built up. From 2015 to 2017, there is 108.486 unit toilet, 32.711 units of clean water facility, 65.918 unit ground retainer and 30.212 unit of well(Hidayah, 2019).

Cash for Work (Padat Karya Tunai)

There is special programme from Dana Desa named Cash-for-work (Padat Karya Tunai). It is a programme where low-middle income people or even general society can participate on PKT programme. They will be workers on the infrastructure projects from Dana Desa and the get paid based on their working hours. From table 7, it seems that all value in 2014 is 0 because the Dana Desa programme has not been implemented yet. Then, in 2016 there are two groups of society type, which are: working in formal sectors and working in

informal sectors (underemployment). It shows that, the area which has more people who work on informal working sectors (underemployment) will give more impact on PKT programme. In this research context, more informal workers will use their free time to work in PKT to build clean water and sanitation infrastructure.

Table 7. Formal and Informal workers

Variable	Obs	2014		2016 Formal workers		2016 Informal workers	
		Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
PKT	405	0	0	.65	.533	3.949	2.55

Source: Own calculation, 2019

Table 8. Cash for Work (Padat Karya Tunai)

		Clean water		Sanitation	
	(1)	(2)	(3)	(4)	(5)
VARIABLES	PKT	Formal workers	Informal worker/underemployment	Formal workers	Informal worker/underemployment
danadesa	601.9**	-1.905	0.778**	17.00	5.475**
	(273.8)	(8.632)	(0.363)	(53.86)	(2.488)
				(68.80)	(2.941)
Constant	-21,408	212.9	-16.14	102.9	-21.61
	(38,534)	(1,427)	(47.98)	(1,450)	(49.02)
Observations	812	812	812	812	812
R-squared	0.400	0.196	0.575	0.196	0.576
Number of did	405	405	405	405	405
Year Dummy Variables	YES	YES	YES	YES	YES
District Fixed Effect	YES	YES	YES	YES	YES
Control Variables	YES	YES	YES	YES	YES

*Note: The independent variable, namely educational attainment, electricity access, household energy access, gender, house ownership and marital status. The full result can be accessed in the appendices. The robust standard errors in parentheses are: *** p<0.01, ** p<0.05, * p<0.1.*
Source: Own Identification, 2019.

Table 9. The impact of Dana Desa on Clean Water and Sanitation Access based on Geographical Conditions.

VARIABLES	(1) Development of sanitation	(2) Development of clean water
Dana desa	0.914***	15.69**
	(0.349)	(7.297)
Constant	-10.23	33.49
	(47.97)	(1,433)
Observations	812	812
R-squared	0.584	0.203
Year Dummy Variables	YES	YES
District Fixed Effect	YES	YES
Control Variables	YES	YES
Number of did	405	405

*Note: The independent variable, namely educational attainment, electricity access, household energy access, gender, house ownership and marital status. The full result can be accessed in the appendices. The robust standard errors in parentheses are: *** p<0.01, ** p<0.05, * p<0.1.*
Source: Own Identification, 2019.

This research will analyse PKT participation based on people's working sectors (see Table 8). Based on researcher analysis, there is two classifications of jobs, namely: formal worker (i.e : in bank, civil servant, an employee in the company) and informal worker (i.e.: farmer, fisherman, etc) in the national level. Table 8 shows that the increase of 10 billion Dana Desa in districts level will give no impact on PKT participation for people who work in the formal sectors. However, there is an increase of PKT participation for people who work in the informal sectors which are 0.77 percentage point for clean water projects and 5.47 percentage point for sanitation projects (see Table 8).

Another important point, in rural areas, the geographical situation means water is rare and not affordable for all — most rural areas consist of poor infrastructure and difficult geographical conditions. For instance, on a mountainside, near a cliff or even in the middle of the jungle (Hidayah, 2019). All the obstacles associated with geographical conditions are possible in Indonesia's rural areas. This makes it challenging for people to access clean water. Thus, more effort is required to access it.

Many obstacles and challenges need to be tackled. The examples are because of the lack of financial support, political interest and awareness, geographical conditions, etc, and benefit people whether they live in rural or urban areas. Investment in sanitation and water offers high economic, social and environmental returns. (Briscoe, 1993). Clean water and sanitation also are an international concern. Baietti & Raymond (2005), explain that the World Commission on Water estimated that investments in water supply and sanitation alone would need to double from the current US$15 billion to US$30 billion annually to meet the

Millennium Development Goals. The Millennium Development Goals are targeted with the aim of allowing those people with no access to have essential access to water and sanitation.

Table 9 shows the positive and significant impact of Dana Desa on clean water and sanitation access. The increase of 10 billion Dana Desa at the district level will increase 0.9 and 15.69 point percentages of clean water and sanitation access, respectively. It shows that easier geographical conditions will give better outcomes. Table 18 shows the positive and significant impact of Dana Desa on clean water and sanitation access. The increase of 10 billion Dana Desa at the district level will increase 0.9 and 15.69 % points of clean water and sanitation access, respectively. It shows that easier geographical conditions will give better outcomes.

7. Conclusion

The study concludes that Dana Desa will affect clean water and sanitation access through PKT (cash-for-work) program signifficanly in the rural areas which have more people who work in informal sector. Moreover, Dana Desa will give positive impact to clean water and sanitation in the areas with good geographical conditions.

It is also crucial to note that human capital readiness has to be taken into account. The incapability of the local government to organize and empower the community might be the reason for the insignificant result of Dana Desa on developing clean water access. Therefore, poorly organised communities are not only less likely to obtain projects but are also likely to mismanage CDD projects that are allocated to them (Casey, 2011). For instance, the failure of local government to involve people in the process of discussing and arranging the programme's plan.

This study give recommendation to government to optimize more PKT program in the area which do not have a good geographical conditions. Because people who have proper clean water and sanitation, they can be more efficient in maximising their time to work and improve their health. People in rural areas which do not have basic clean water access will walk miles to water sources to collect water to use in cooking, washing, etc.

8. Acknowledgement

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