Impact Evaluation Report on the ARMM Social Fund for Peace and Development Project (the Philippines)

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JAPAN INTERNATIONAL COOPERATION AGENCY

SOPHIA UNIVERSITY

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Glossary

ARMM: The Autonomous Region in Muslim Mindanao
ATET: Average Treatment Effects on the Treated
CDA: Community Development Assistance
CDD: Community-Driven Development
CIDA: The Canadian International Development Agency
DID: Difference-In-Differences
FE: Fixed Effects
JICA: Japan International Cooperation Agency
OLS: Ordinary Least Squares
PSM: Propensity Score Matching

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1. Introduction

This report analyzes the socio-economic impacts of the Autonomous Region in Muslim Mindanao (ARMM) Social Fund for Peace and Development Project (hereafter "the Project") in the Philippines, conducted from 2003 to 2012 through parallel financing by the Japan International Cooperation Agency (JICA), the World Bank, and the Canadian International Development Agency (CIDA). The primary component of the Project was construction and rehabilitation of small-scale infrastructure in selected disadvantaged villages using a community-driven development (CDD) approach, where citizens in the villages were involved in making decisions about the construction of needed facilities.

To analyze the impacts of the Project, JICA conducted village- and household-level surveys in project villages (i.e., treatment group) and non-project villages (i.e., control group) in 2015. These surveys collected information on the current utilization of Project facilities, obtained subjective evaluations by beneficiaries, and measured objective socio-economic indicators that may have been affected by the Project.

A subjective evaluation of the current status of the facilities showed that almost all were functioning adequately, well utilized, and highly satisfactory to the beneficiaries. In addition, approximately 40-50% of citizens in the treatment group stated that the Project's processes, such as citizen involvement, information disclosure, and conflict prevention, were superior to other development projects.

As for the socio-economic indicators, a village-level analysis using the difference-in-differences (DID) method revealed positive effects on the number of educational facilities (kindergartens and elementary schools), access to toilets, and local security. A household-level analysis using propensity score matching (PSM) also showed improvements in multidimensional indicators such as income, consumption, transportation, water and sanitation, local security, and trust in others; however, there were negligible impacts on educational enrollment, health conditions, and community activities.

The rest of the report is organized as follows: Section 2 summarizes the Project. Section 3 explains the survey, data, and methods of analysis. Section 4 confirms the descriptive statistics on the current utilization of Project facilities and subjective evaluations by beneficiaries. Section 5 presents the results of rigorous impact evaluations at the village and household levels. Finally, section 6 summarizes and discusses the empirical findings.

2. Summary of the ARMM Social Fund for Peace and Development Project

2.1. Project Components

The Project was conducted in the ARMM area (see Figure 2-1) from 2003 to 2012 through parallel financing by JICA, the World Bank, and CIDA. The Project's objectives were: to provide basic social services, increase job opportunities, and promote sustainable development by accelerating employment, thereby contributing to reducing poverty.
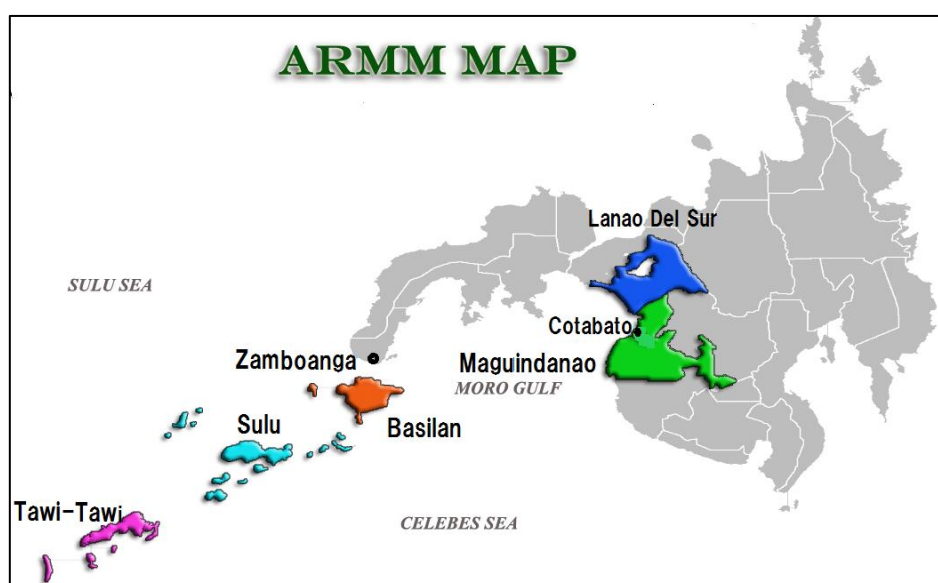
Figure 2-1   Location of Project Sites

Source: Documents provided by the Japan International Cooperation Agency (JICA)

The Project comprised the following four components:

(1) Community development assistance (CDA): construction and rehabilitation of village-level infrastructure.

(2) Strategic regional investment: construction and rehabilitation of regional infrastructure.

(3) Peacebuilding: an educational program about peace, a campaign for human rights, the establishment of a peace center, and others.

(4) Institutional strengthening and assistance for governance: financial assistance to ARMM governments and local government units, and strengthening of project management capabilities.

Among these components, CDA was the primary intervention, involving construction and rehabilitation of basic socio-economic infrastructure such as roads, health clinics, schools, community centers, water systems, public toilets, post-harvest facilities, and others (Figure 2-2). The average construction cost of a sub-project was 730,000 pesos, which is equivalent to about 17,300 U.S. dollars in the final year of the Project[1].

Figure 2-2   Examples of Facilities Constructed through CDA

Source: Documents provided by JICA

2.2.   Coverage and Selection of the Project

Table 2-1 shows the number of villages that received CDA (treatment villages) and did not (control villages). The Project covered approximately 65% of villages in the ARMM, in which JICA supported 354 villages in 5 provinces.

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[1] The average exchange rate of Philippine peso (PHP) to the U.S. dollar (USD) in 2012 was PHP. 42.2/ USD.

Table 2-1　Coverage of Community Development Assistance (Number of Treatment and Control Villages)

Province	Treatment Villages			Control Villages	Total
	JICA	World Bank (Phase I)	World Bank (Phase II)		
Lanao del Sur	136	279	225	519	1,159
Maguindanao	95	178	143	92	508
Basilan	40	42	69	59	210
Sulu	51	107	97	155	410
Tawi-Tawi	32	59	66	46	203
Total	354	665	600	871	2,490

Source: Documents provided by JICA.

For the selection of treatment villages, a composite score for each village (called the "prioritization score") was calculated based on nine criteria: 1) "access to water supply" (15 points); 2) "access to health facility" (15 points); 3) "availability of other projects" (10 points); 4) "number of internally displaced family" (20 points); 5) "total population" (10 points); 6) "percentage of women headed households" (5 points); 7) "percentage of indigenous peoples" (5 points); 8) "distance from Poblacion (the central district) of the municipality" (5 points); and 9) "road conditions" (15 points). Then, approximately six villages with high scores were selected per municipality (see Figure 2-3).
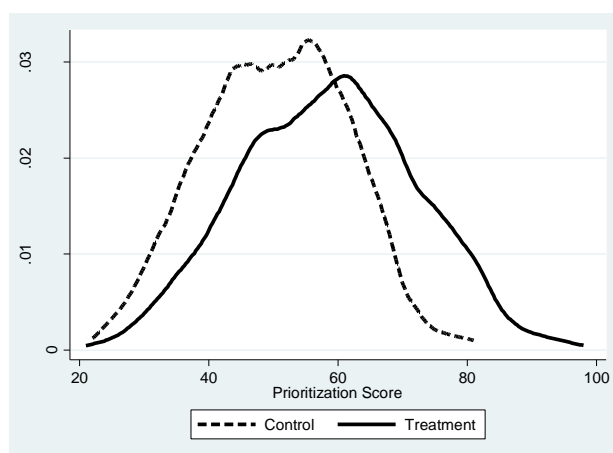

Figure 2-3　Distribution of Prioritization Scores for All Villages in the Autonomous Region in Muslim Mindanao

Source: Author's compilation of documents provided by JICA

2.3. Project Period

The Project was originally planned for December 2003 to December 2007 (49 months). However, due to delays in budget allocation and expansion of the area covered, the actual period stretched from December 2003 to December 2012 (108 months). The special account needed for loan withdrawals, especially for CDA, was made available only in May 2007, and by then construction had started in the treatment villages. Although the completion of construction differed for each facility, almost all facilities supported by JICA were completed between 2008 and 2012.

3. Survey and Method of Analysis

3.1. Survey

JICA conducted two types of survey in the ARMM from April to July 2015 to analyze the Project's impacts of JICA-financed component. The first was a village-level survey that asked village chairpersons (also called "barangay captains") about demographic characteristics, socio-economic status, community activities, local security, and interventions by the Project and other governmental and foreign aid projects. The second survey was at the household level and asked about multidimensional aspects of life, such as the economy, access to basic social services, education, health, security, community activities, and trust in others as indicators of social capital.

These surveys were conducted in both CDA treatment villages supported by JICA and control villages where the Project had not intervened. Due to budget constraints and security problems, the survey area was limited to the provinces of Lanao del Sur and Maguindanao.

To compare the treatment and control groups effectively, the surveys were designed to sample villages and households with similar characteristics from both groups. The village-level survey covered all treatment villages (231 in total) in the two provinces and correspondingly sampled 231 control villages with the nearest prioritization score to each treatment village within each municipality. This was because the pairing of project and non-project villages with the nearest scores would ensure similar socio-economic conditions were present before intervention by the Project. Figure 3-1 shows that the treatment and control groups covered by the survey had similar distributions of prioritization scores, which confirms that the surveyed control group was a good comparison and "counterfactual" of the treatment group.

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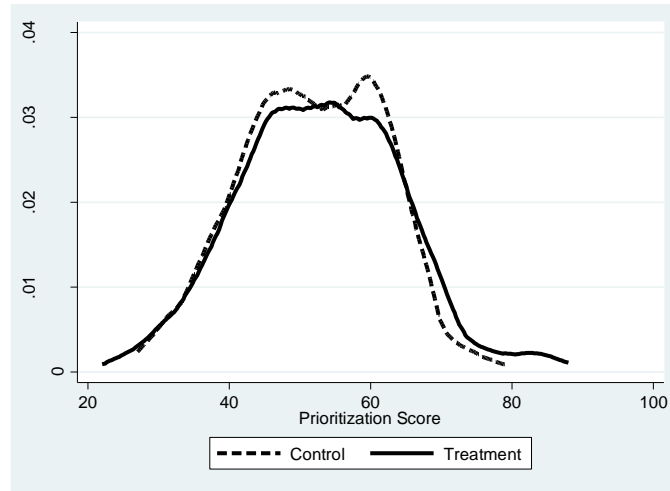
Figure 3-1　Distribution of Prioritization Scores for Villages Targeted by the Survey

Source: Author's compilation of documents provided by JICA

For the household-level survey, 50 pairs of project and non-project villages were randomly selected, then 15 households were again randomly sampled per village. Since there were some villages where the survey could not be conducted due to security issues, the total sample size was 458 villages (i.e., 229 villages for each group) for the village-level survey and 1,470 households (i.e., 735 households for each group) for the household-level survey.

3.2. Method of Analysis[2]

In line with the two surveys, this study analyzes both village-level and household-level impacts of the Project. Our framework for data structure and analysis is summarized in Table 3-1.

Table 3-1　Framework of Impact Evaluation

Unit of Analysis	Sample Size			Data Structure	Method of Analysis
	Treat.	Control	Total		
Village	229	229	458	Panel data	DID*
Household	735	735	1,470	Cross-section data	OLS*、PSM*

Note: DID = Difference-In-Difference Method, PSM = Propensity Score Matching Method, OLS = Ordinary Least Squares

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[2] For details on the methods employed in this study, see Khandker et al. (2010).

We estimated the average treatment effects on the treated (ATET) as the measurement of impacts, which was the mean impact on the outcome variable among villages or households treated by the Project. For the village-level analysis, we utilized an additional dataset collected through another project[3] by JICA in 2007. This dataset includes village-level information on, for example, socio-economic infrastructure (schools, health facilities, and others), the conditions of water supply and sanitation, incidence of conflict, and community organizations in Mindanao. Since these indicators are outputs and outcomes of the Project, and construction of facilities was completed in stages after 2008, as explained in section 2.3, the dataset can be regarded as pseudo-baseline data used to make panel data combined with the present dataset.

Based on the two-period setting, we employed DID estimation, which compared the outcomes of the treatment and control groups before and after the Project. Theoretically, the DID estimator is defined as

$$\beta_{DID} = E(Y_1^T - Y_0^T | T = 1) - E(Y_1^C - Y_0^C | T = 0),$$

where E denotes the expectation operator; Y_0^T and Y_1^T are outcomes of the treatment group before and after the Project, respectively; Y_0^C and Y_1^C are corresponding outcomes of the control group; and T is the binary (0 or 1) treatment indicator, which takes 1 if the village or household was treated by the Project. To control other variables that may affect the outcome, DID can be estimated in a regression form,

$$Y_{it} = \alpha + \beta_{DID} T_i t + \gamma T_i + \delta t + \theta X_{it} + \varepsilon_{it},$$

where Y_{it} is the outcome of village or household i at time t, which takes 0 before the Project and 1 after the Project; X_{it} is a vector of other control variables; ε_{it} is the error term; and α, γ, δ, and θ are parameters to be estimated.

For the household-level analysis, we had no data from before the Project and had to depend on the current cross-section data only. One of the major evaluation methods using cross-section data is PSM, which compares outcomes of treatment and control groups with similar characteristics in terms of the probability of participation in the Project (i.e., propensity score)[4]. By setting the propensity score conditional on the

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[3] The Study for the Socio-Economic Reconstruction and Development of Conflict Affected Areas in Mindanao (SERD-CAAM). For the details, see the final report ("3. BARANGAY PROFILING," http://open_jicareport.jica.go.jp/pdf/11991312_02.pdf).
[4] A similar approach to household-level PSM in a village-level intervention was adopted in Wanjala and Muradian's (2013) impact evaluation of the Millennium Village Project.

observed characteristics of X as $P(X) = \Pr(T - 1|X)$, the ATET of PSM was defined as

$$\beta_{PSM} = E_{P(X)|T=1}\{E[Y^T|T = 1, P(X)] - E[Y^C|T = 0, P(X)]\},$$

or more specifically,

$$\beta_{PSM} = \frac{1}{N_T}\left[\sum_{i \in T} Y_i^T - \sum_{j \in C} \omega(i,j)Y_i^C\right],$$

where N_T is the number of villages or households in the treatment group and $\omega(i,j)$ is the weight used to aggregate outcomes for the matched control villages or households.

The weight was defined in different ways depending on the choice of matching algorithm. We adopted two standard algorithms: (1) nearest-neighbor matching, where each treatment household was matched to the control household with the closest propensity score, and (2) kernel matching, which used a weighted average of all control households through a nonparametric approach.

When employing PSM, the quality of the matches should be examined. Figure 3-2 shows the distributions of the propensity scores for the treatment and control households, which confirms their similar distributions (for details on logit and probit estimation, see Appendix Table A1). In Table 3-2, the balance test indicates no statistically significant differences in characteristics between both groups after matching. These results support the quality of the matches and analysis of the PSM estimations. In addition to PSM, ordinary least squares (OLS) was also used for a robustness check.
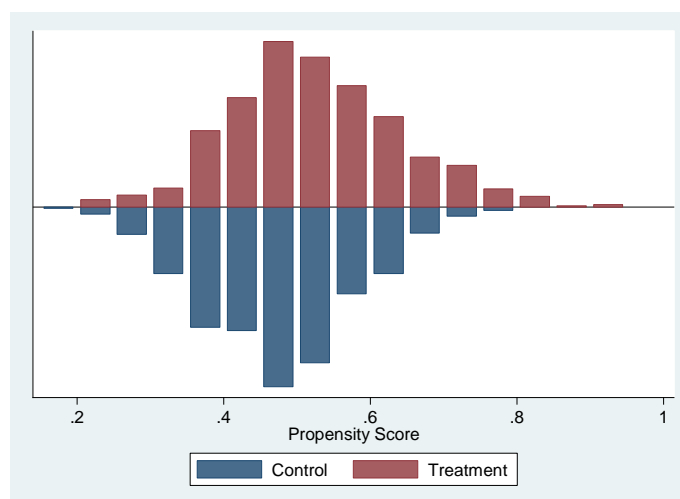
Figure 3-2   Distribution of Propensity Scores

Source: Impact Survey of ASFPDP

Table 3-2　Balance Test: Differences in Household Characteristics before and after Matching

Variable	Before& After Matching	Mean		t-test
		Treated	Control	(p-value)
Ethnicity: Non-Maranao	Before	.27347	.27075	0.907
(=1)	After	.27347	.26014	0.564
Religion: Non-Islam	Before	.06531	.07347	0.538
(=1)	After	.06531	.0634	0.882
Num of household member	Before	6.6272	6.2721	0.012**
(person)	After	6.6272	6.6249	0.988
Duration of residence	Before	30.184	29.555	0.493
(year)	After	30.184	30.328	0.876
Education of HH head:	Before	.65714	.73061	0.002***
Elementary & below (=1)	After	.65714	.64857	0.730
Education of HH head:	Before	.08299	.0449	0.003***
University & above (=1)	After	.08299	.0781	0.730
Residential structure:	Before	.98367	.97687	0.349
Single (=1)	After	.98367	.97905	0.512
Residential structure:	Before	.76327	.68163	0.000***
Strong roof material (=1)	After	.76327	.75578	0.737
Residential structure:	Before	.64626	.54422	0.000***
Strong wall material (=1)	After	.64626	.62884	0.488
Residential structure:	Before	.75238	.74966	0.904
Strong floor material (=1)	After	.75238	.74041	0.598
Owner of motorcycle	Before	.19456	.12381	0.000***
(=1)	After	.19456	.18776	0.740
Owner of car	Before	.04354	.01497	0.001***
(=1)	After	.04354	.05197	0.449
Owner of bicycle	Before	.06122	.04898	0.304
(=1)	After	.06122	.06259	0.914
Rural area	Before	.79592	.73469	0.006***
(=1)	After	.79592	.76286	0.127
Population in the village	Before	7.0086	6.9167	0.009***
(log, person)	After	7.0086	7.0149	0.863
Cost of other projects	Before	6.1921	5.898	0.020**
(log, pesos)	After	6.1921	6.2537	0.596

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

　　In the household-level analysis, the study should focus on impacts on poor households because the final target of the Project was poverty alleviation. However, we could not identify which households were poor before the Project without baseline data. As the next best option, we conducted an additional sub-sample analysis of "low-education households," defined as households whose head's education level was completion of elementary school or less. This was because the education level of the household head is an indicator that is almost time-invariant and highly correlates with levels of income and consumption.

3.3. Outputs and Outcomes

Since many different facilities were constructed through the Project, a wide range of impacts were expected in this study. To cover the multidimensional effects as much as possible, we selected various socio-economic indicators as outputs and outcomes based on previous studies on similar CDD projects, especially the impact study of KALAHI-CIDSS, the sister program of the Project in the Philippines (World Bank, 2011).

Table 3-3 summarizes the expected outputs and outcomes of the village- and household-level analyses. For the village-level analysis, the output-based indicators of education, water sources and sanitation, and health were considered. Although impacts on community activities and local security were not targeted explicitly by the Project, the number of community groups and frequency of conflicts were added, since such indicators were examined in previous studies (Crost et al. 2014, Labonne and Chase 2011).

For the household-level analysis, consumption, income, and transportation to markets were added. We also included trust in people and officials as indicators of social capital, usually analyzed in impact evaluations of CDD projects (Labonne and Chase 2011, Casey et al. 2012).

Table 3-3　Expected Outputs and Outcomes of the Project

Unit of Analysis	Category	Indicators
Village	Education	Number of educational facilities per 1,000 citizens
	Water & Sanitation	% with access to water sources and toilets
	Health	Number of health facilities per 1,000 citizens
	Community Activities and Security	Number of community groups per 1,000 citizens
		Frequency of conflicts in the last 5 years
Household	Consumption	Annual consumption per capita by item
	Income	Annual income per capita by source
	Transportation	Time, cost, and road conditions to markets
	Education	Time to educational facilities and child's enrollment
	Water & Sanitation	Access to water sources and toilets
	Health	Time to health facilities and health conditions
	Community Activities and Security	Attendance of community activities and assemblies
		Conflict and disaster affectedness
	Trust	Trust in people and officials

4. Current Status of Facilities and Subjective Evaluations by Beneficiaries

In both the village- and household-level surveys, village chairpersons and households in the treatment group were asked whether the facilities constructed by the Project were currently functional and utilized, and how they evaluated the Project subjectively. This section summarizes the results.

4.1. Subjective Evaluations by Village Chairpersons

Table 4-1 shows the number of facilities constructed through the Project and statistics of the total number of annual users by infrastructure type. As for the number of facilities, agricultural facilities (e.g., post-harvest storage) and community centers made up 57% of the total. On the other hand, roads, water supply systems, and health facilities had more beneficiaries than the others on average.

Table 4-1　Number of Facilities and Users

Type of Sub-project	# of Facilities		# of Users/Year		
	#	%	Total	Mean	Median
Agriculture	154	31.6	29,158	191	80
Community Center	124	25.5	32,837	265	120
Road	56	11.5	63,560	1,135	1,000
School	55	11.3	10,628	193	84
Water Supply	46	9.5	25,400	564	239
Health	24	4.9	16,665	725	178
Toilet	18	3.7	5,133	285	114
Others	10	2.1	7,688	769	691
Total	487	100.0	191,069	395	110

Source: Impact Survey of ASFPDP

Table 4-2 classifies the facilities' condition and utilization into four categories: (A) good condition with a high frequency of utilization, (B) good condition with a medium frequency of utilization, (C) good condition with a low frequency of utilization, and (D) bad condition and unavailable. Although some malfunctions were reported, 94% of facilities were evaluated as (A) or (B). In line with these results, village chairpersons were satisfied with 93% of facilities (Table 4-3). These reports imply that facilities constructed through the Project achieved high performance and provided basic socio-economic services.

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Table 4-2　Facilities' Condition and Frequency of Use

Type of Sub-project	(A) Cond.: Good Freq.: High	(B) Cond.: Good Freq.: Medium	(C) Cond.: Good Freq.: Low	(D) Cond.: Bad	Total
Agriculture	133	20	0	1	154
Community Center	83	32	6	3	124
Road	51	4	0	1	56
School	51	2	1	1	55
Water Supply	22	11	5	8	46
Health	21	2	0	1	24
Toilet	12	5	0	1	18
Others	9	0	0	1	10
Total	382	76	12	17	487
Total (%)	78.4	15.6	2.5	3.5	100.0

Source: Impact Survey of ASFPDP

Note: (A) good condition with a high frequency of utilization, (B) good condition with a medium frequency of utilization, (C) good condition with a low frequency of utilization, and (D) bad condition and unavailable.

Table 4-3　Satisfaction of Village Chairpersons with Facilities

Type of Sub-project	Very Satisfied	Satis-fied	Unsure	Dissatis-fied	Very Dissatisfied	Total
Agriculture	118	34	2	0	0	154
Community Center	83	32	6	2	1	124
Road	26	27	2	0	1	56
School	45	7	2	1	0	55
Water Supply	20	14	4	6	2	46
Health	17	5	1	1	0	24
Toilet	7	10	0	0	1	18
Others	4	5	0	0	1	10
Total	320	134	17	10	6	487
Total (%)	65.7	27.5	3.5	2.1	1.2	100.0

Source: Impact Survey of ASFPDP

4.2. Subjective Evaluations by Households

In the household survey, respondents were asked whether they knew about the Project and had attended a related meeting. As shown in Table 4-4, 68% (501 households) of the sample in the treatment group recognized the Project and about half (277 households) had attended a village meeting about it. For the respondents who knew about the Project, the survey investigated their subjective evaluation of it.

Table 4-4　Recognition of the Project and Attendance of Related Meetings

Unit: Number of households

		Have you attended a meeting on the Project?		Total
		Yes	No	
Do you know	Yes	277	224	501
the Project?	No	0	234	234
	Total	277	458	735

Source: Impact Survey of ASFPDP

Table 4-5 contains the respondents' impressions of the effects of the Project regarding five aspects of the community: (1) community activities, (2) trust among citizens, (3) access to information on public services, (4) impression of officials, and (5) knowledge of project management; 65-70% of respondents admitted these aspects had been improved by the Project. When it came to a comparison with other development projects (

Table **4-6**), more or less 45-50% of respondents answered that the Project showed better performance in: (1) citizen participation, (2) reflection of local needs, (3) communication between citizen groups, (4) communication between citizens and officials, (5) information disclosure, and (6) conflict prevention measures.

Regarding the constructed facilities, 94% of respondents were satisfied with them (Table 4-7), and almost all answered that the facilities are properly utilized, operated, and maintained (Table 4-8). Combined with the views of the village chairpersons, it can be concluded that the processes and outputs (i.e., constructed facilities) of the Project were highly appreciated by the beneficiaries.

Table 4-5　Subjective Evaluations of the Project

Unit: Number of households

		Improved	No change	Worsened	Unknown	Total
Community Activities	N	350	54	0	97	501
	%	69.9	10.8	0.0	19.4	100.0
Trust among Citizens	N	350	54	0	97	501
	%	69.9	10.8	0.0	19.4	100.0
Access to Info. on Public Services	N	338	67	1	95	501
	%	67.5	13.4	0.2	18.9	100.0
Impression of Officials	N	329	68	5	99	501
	%	65.7	13.6	1.0	19.8	100.0
Knowledge of Project Management	N	338	62	2	99	501
	%	67.5	12.4	0.4	19.8	100.0

Source: Impact Survey of ASFPDP

Table 4-6　Subjective Evaluations of the Project Compared with Other Projects

Unit: Number of households

		Improved	No change	Worsened	Total
Citizen Participation in Decision Making	N	259	239	3	501
	%	51.7	47.7	0.6	100.0
Reflection of Local Needs	N	254	245	2	501
	%	50.7	48.9	0.4	100.0
Communication bet. Citizen Groups	N	232	265	4	501
	%	46.3	52.9	0.8	100.0
Communication bet. Citizens & Officials	N	227	268	6	501
	%	45.3	53.5	1.2	100.0
Info. Disclosure & Transparency	N	226	270	5	501
	%	45.1	53.9	1.0	100.0
Measures against Conflicts	N	220	276	5	501
	%	43.9	55.1	1.0	100.0

Source: Impact Survey of ASFPDP

Table 4-7　Satisfaction of Households with Facilities

Type of Sub-project	Very Satisfied	Satis-fied	Unsure	Dissatis-fied	Very Dissatisfied	Total
Agriculture	104	119	3	0	8	234
Community Center	86	87	1	4	5	183
Road	57	35	0	2	9	103
School	35	20	0	0	1	56
Water Supply	5	29	2	4	1	41
Health	21	15	0	0	0	36
Toilet	16	9	0	0	0	25
Others	10	9	0	0	1	20
Total	334	323	6	10	25	698
Total (%)	47.9	46.3	0.9	1.4	3.6	100.0

Source: Impact Survey of ASFPDP

Note: The survey collected 698 answers from 501 households who know the Project.

Table 4-8　Facilities' Utilization, Operation, and Maintenance

Type of Sub-project	Is the facility properly utilized?			Is the facility properly operated and maintained?		
	Yes	No	Total	Yes	No	Total
Agriculture	230	4	234	229	5	234
Community Center	177	6	183	180	3	183
Road	100	3	103	94	9	103
School	56	0	56	56	0	56
Water Supply	34	7	41	35	6	41
Health	36	0	36	35	1	36
Toilet	25	0	25	25	0	25
Others	20	0	20	20	0	20
Total	678	20	698	674	24	698
Total (%)	97.1	2.9	100.0	96.6	3.4	100.0

Source: Impact Survey of ASFPDP

Note: The survey collected 698 answers from 501 households who know the Project.

5. Impact Evaluation

5.1. Summary of Results

This section analyzes the village- and household-level impacts of the Project using the rigorous evaluation methods explained in section 3. Table 5-1 summarizes the results, with the indicators classified as "Improved," "No change," or "Worsened" by socio-economic category.

For the village-level analysis, 4 out of 12 indicators of education, sanitation, and community security were judged as improved. For the household-level analysis, 29 indicators across all categories showed positive signs of improvement, whereas 4 showed negative effects. Regarding low-education households, whose results are shown in parentheses in Table 5-1, 32 indicators were judged as improved.

Table 5-1　Summary of Impact Evaluation

Unit: Indicator

Unit of Analysis	Category	Indicators			
		Improved	No change	Worsened	Total
Village	Education	2	1	0	3
	Water & Sanitation	1	2	0	3
	Health	0	3	0	3
	Community	1	2	0	3
	Total	**4**	**8**	**0**	**12**
Household	Income	5 (5)	1 (2)	1 (0)	7
	Expenditure	4 (7)	4 (2)	1 (0)	9
	Transportation	4 (4)	0 (0)	0 (0)	4
	Education	3 (5)	2 (1)	1 (0)	6
	Water & Sanitation	5 (4)	0 (1)	0 (0)	5
	Health	1 (1)	4 (4)	0 (0)	5
	Community	1 (2)	4 (3)	0 (0)	5
	Trust	6 (4)	4 (6)	1 (1)	11
	Total	**29 (32)**	**19 (19)**	**4 (1)**	**52**

Note: Indicators were classified as "improved" or "worsened" if the estimated ATET were statistically significant at (at least) the 10% level. The results for low-education households are in parentheses.

5.2. Village-Level Impact Evaluation

5.2.1. Education

Table 5-2 lists the average number of kindergartens, elementary schools, and secondary schools per 1,000 citizens in the treatment and control villages in 2007 and 2014. Under the Project, mainly kindergartens and elementary schools were constructed, and the DID estimators in Table 5-3 confirm their positive impacts.

Table 5-2   Number of Schools (per 1,000 Citizens)

	2007		2014		Difference		Simple DID
	Treat.	Control	Treat.	Control	Treat.	Control	
Kindergarten	0.203	0.169	0.752	0.555	0.549	0.386	0.163**
Elementary School	0.640	0.729	0.726	0.638	0.087	-0.090	0.177**
Secondary School	0.112	0.091	0.116	0.163	0.004	0.071	-0.068**

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-3   Impacts on Number of Schools (per 1,000 Citizens)

	DID without Controls			DID with Controls		
	Kinder-garten	Elementary School	Secondary School	Kinder-garten	Elementary School	Secondary School
Treatment Effect	0.163**	0.177*	-0.068	0.180**	0.200**	-0.068
	(0.074)	(0.094)	(0.044)	(0.076)	(0.096)	(0.044)
Municipal. FE	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	No	No	No	Yes	Yes	Yes
Sample Size	458	458	458	458	458	458
Adjusted R-Sq.	0.323	0.170	0.098	0.333	0.189	0.135

Source: Impact Survey of ASFPDP

Notes: Robust standard errors clustered by municipality are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

FE = Fixed effects.

5.2.2. Water and Sanitation

Table 5-4 shows the percentage of citizens who had access to water systems, rivers and ponds, and toilets. The DID estimators in Table 5-5 show a positive impact on access to toilets, which increased by 8.6%. Although the effects on access to water sources indicated a shift in water sources from rivers and ponds to water systems, they were not statistically significant.

Table 5-4　Access to Water Sources and Toilets

	2007		2014		Difference		Simple
	Treat.	Control	Treat.	Control	Treat.	Control	DID
Access to Water Systems (%)	68.20	58.48	77.11	66.80	8.90	8.31	0.59
Access to Rivers & Ponds (%)	13.91	15.63	13.72	20.30	-0.18	4.67	-4.85
Access to Toilets (%)	37.40	46.71	45.69	45.59	8.29	-1.12	9.40**

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-5　Impacts on Access to Water Sources and Toilets

	DID without Controls			DID with Controls		
	Access to Water Systems (%)	Access to Rivers & Ponds (%)	Access to Toilets (%)	Access to Water Systems (%)	Access to Rivers & Ponds (%)	Access to Toilets (%)
Treatment Effect	0.589	-4.852	9.404**	0.700	-3.352	8.611**
	(4.841)	(3.974)	(4.132)	(4.940)	(3.953)	(4.027)
Municipal. FE	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	No	No	No	Yes	Yes	Yes
Sample Size	458	458	458	458	458	458
Adjusted R-Sq.	0.356	0.300	0.355	0.371	0.349	0.424

Source: Impact Survey of ASFPDP

Note: Robust standard errors clustered by municipality are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.2.3. Health

Table 5-6 lists the average number of hospitals, rural health units, and barangay (i.e., village) health stations (BHS) per 1000 citizens in the treatment and control villages in 2007 and 2014. Among them, BHS were mainly constructed by the Project and were expected to increase. However, the DID estimators in Table 5-7 show no impacts on BHS or the others. This is probably because the sub-projects included not only new construction but rehabilitation of existing health facilities.

Table 5-6　Number of Health Facilities (per 1,000 Citizens)

	2007		2014		Difference		Simple DID
	Treat.	Control	Treat.	Control	Treat.	Control	
Hospital	0.011	0.011	0.007	0.001	-0.004	-0.010	0.006
Rural Health Unit	0.040	0.001	0.046	0.014	0.006	0.013	-0.007
Barangay Health Station	0.158	0.087	0.247	0.115	0.089	0.027	0.062

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-7　Impacts on Number of Health Facilities (per 1,000 Citizens)

	DID without Controls			DID with Controls		
	Hospital	Rural Health Unit	Barangay Health Station	Hospital	Rural Health Unit	Barangay Health Station
Treatment Effect	0.006	-0.007	0.062	0.004	-0.004	0.058
	(0.010)	(0.020)	(0.045)	(0.010)	(0.020)	(0.046)
Municipal. FE	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	No	No	No	Yes	Yes	Yes
Sample Size	458	458	458	458	458	458
Adjusted R-Sq.	0.078	0.112	0.156	0.123	0.141	0.168

Source: Impact Survey of ASFPDP

Note: Robust standard errors clustered by municipality are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.2.4. Community Activities and Security

Table 5-8 displays the number of community groups (e.g., cooperatives or organizations of farmers, women, youth, and others), "active community groups" (defined as groups that have been active regularly for more than 6 months with more than 10 members), and frequency of any conflicts in the last 5 years. Since the frequency of conflicts was over-dispersed count data with many zeros, a negative binomial model was employed in the regressions. Table 5-9 shows no impacts on the number of community groups but a statistically significant impact on conflicts, which indicates the Project has prevented 1.4 conflicts in the last 5 years (i.e., 0.28 conflicts per year) on average.

Table 5-8   Number of Community Groups and Conflicts

	2007		2014		Difference		Simple
	Treat.	Control	Treat.	Control	Treat.	Control	DID
All Community Groups (/1000 citizens)	0.429	0.510	1.248	1.240	0.818	0.730	0.088
Active Community Groups (/1000 citizens)	0.151	0.137	0.318	0.311	0.167	0.173	-0.006
Conflicts	0.738	0.402	1.367	1.690	0.629	1.288	-0.659*

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-9   Impacts on Number of Community Groups and Conflicts

	DID without Controls			DID with Controls		
	All Groups	Active Groups	Conflicts	All Groups	Active Groups	Conflicts
Treatment Effect	0.088	-0.006	-1.574***	0.112	-0.000	-1.403***
	(0.122)	(0.068)	(0.464)	(0.122)	(0.068)	(0.450)
Municipal. FE	Yes	Yes	Yes	Yes	Yes	Yes
Other Controls	No	No	No	Yes	Yes	Yes
Sample Size	458	458	458	458	458	458
Adjusted R-Sq.	0.270	0.229	0.131	0.312	0.257	0.184

Source: Impact Survey of ASFPDP

Notes: Robust standard errors clustered by municipality are in parentheses. For the regression of "conflicts," a negative binomial model was employed and the marginal effects are shown in the table.

5.3. Household-Level Impact Evaluation

5.3.1. Consumption

Table 5-10 describes annual per capita consumption by item for all households in the treatment and control groups. For the results of OLS and PSM shown in
Table **5-11**, PSM estimators implied positive impacts on some items, such as education and others, though these results were not robust by method. There was a negative effect on "water and light," which may be explained as spending on water being reduced thanks to improved access to water systems (see section 5.3.5).

For low-education households, positive impacts became more robust, especially for foods, clothing, and communications (see Table 5-12 and Table 5-13). It is estimated that the Project increased total consumption by 1,100-1,300 pesos, which is statistically significant for all specifications and economically substantial.

Table 5-10 Annual Household Consumption by Item: All Households

Unit: Pesos (per capita)

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Foods	735	10639	735	10258	381
Water & Light	735	204	735	244	-40
Transportation	735	991	735	872	119
Clothing	735	684	735	551	133***
Education	735	1267	735	873	394**
Medical Care	735	698	735	584	114
Communication	735	376	735	308	67*
Others	735	195	735	111	84**
Total	735	15054	735	13802	1252**

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-11   Impacts on Annual Household Consumption by Item: All Households

Unit: Pesos (per capita)

| | OLS | PSM | | |
		NN(10)	NN(30)	Kernel
Foods	52.8	112.8	301.3	-165.2
Water & Light	-64.4	-81.3**	-68.0***	-96.6***
Transportation	-25.9	6.7	87.1	-53.2
Clothing	65.5	30.8	86.7**	45.6
Education	111.8	315.8*	281.1*	272.7
Medical Care	76.6	80.7	63.6	56.0
Communication	-2.2	9.2	29.2	-6.8
Others	71.3*	89.3**	93.7**	90.3**
Total	285.4	564.2	874.9**	142.6

Source: Impact Survey of ASFPDP

Notes: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. NN(10) and NN(30) are the nearest neighbor matching of 10 and 30 observations, respectively.

Table 5-12   Annual Household Consumption by Item: Low-Education Households

Unit: Pesos (per capita)

| | Treatment | | Control | | Difference |
	N	Mean	N	Mean	(t-test)
Foods	483	10257	537	9664	593*
Water & Light	483	216	537	190	26
Transportation	483	882	537	779	103
Clothing	483	614	537	483	131***
Education	483	986	537	733	254**
Medical Care	483	572	537	487	85
Communication	483	322	537	231	91***
Others	483	178	537	109	69
Total	483	14026	537	12676	1351***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-13   Impacts on Annual Household Consumption by Item:
Low-Education Households

Unit: Pesos (per capita)

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Foods	737.3***	560.4*	674.5**	622.1*
Water & Light	-19.3	12.1	14.1	13.2
Transportation	10.2	85.3	118.0*	52.2
Clothing	93.7***	125.5***	120.4***	107.0**
Education	122.5*	185.1*	166.2	185.7*
Medical Care	50.0	67.0	61.9	87.1
Communication	55.3***	75.4***	77.2***	79.2***
Others	35.4	92.2*	85.3*	78.2
Total	1085.4***	1203.3***	1317.9***	1225.2***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.3.2. Income

Table 5-14 lists annual per capita income by source for all households in the treatment and control groups. The results of OLS and PSM shown in Table 5-15 imply positive impacts on some sources and total income, except for agricultural income. It is not clear why there was a negative impact on agricultural income; the agricultural sectors may have turned into industrial and/or service sectors in the treatment villages.

The results for low-education households are shown in Table 5-16 and Table 5-17. It is estimated that the Project increased total income by 1,100-1,600 pesos, which indicates significant gains that account for about 7-10% of the total income of low-education households. Combined with the results for consumption, this supports the view that the Project had a positive impact on economic welfare, especially for low-education and poor households.

Table 5-14   Annual Household Income by Source: All Households

Unit: Pesos (per capita)

| | Treatment | | Control | | Difference |
	N	Mean	N	Mean	(t-test)
Agriculture	734	7667	735	8693	-1026**
Manufacture	734	215	735	61	153**
Construction	734	652	735	483	170
Business	734	5241	735	3553	1688***
Employment	734	2748	735	1341	1407***
Others (Remittance)	734	2153	735	1993	160
Total	734	18676	735	16124	2552***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-15   Impacts on Annual Household Income by Source: All Households

Unit: Pesos (per capita)

| | OLS | PSM | | |
		NN(10)	NN(30)	Kernel
Agriculture	-799.7	-559.9	-626.8	-909.3**
Manufacture	129.1	177.1***	173.5***	174.4***
Construction	205.2	225.5*	231.6*	211.2*
Business	978.5	681	1194.0**	843.6
Employment	215.0	968.7**	883.8*	680.1
Others (Remittance)	251.6	260.7	145.4	239.8
Total	979.7	1753.1**	2001.7***	1240.1

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-16   Annual Household Income by Source:
Low-Education Households

Unit: Pesos (per capita)

| | Treatment | | Control | | Difference |
	N	Mean	N	Mean	(t-test)
Agriculture	482	8462	537	9071	-609
Manufacture	482	240	537	65	174**
Construction	482	760	537	491	269*
Business	482	3907	537	2728	1179**
Employment	482	1069	537	489	579**
Others (Remittance)	482	1758	537	1575	183
Total	482	16196	537	14420	1776***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-17   Impacts on Annual Household Income by Source:
Low-Education Households

Unit: Pesos (per capita)

| | OLS | PSM | | |
		NN(10)	NN(30)	Kernel
Agriculture	-403.0	-572.5	-441.7	-473.0
Manufacture	113.0	197.9**	204.9**	202.8**
Construction	265.6**	222.7	203.8	254.2
Business	662.8**	926.4*	850.3*	823.6*
Employment	317.6	499.8*	492.0*	557.0**
Others (Remittance)	196.1	359.1	329.2	134.6
Total	1152.2***	1633.5***	1638.7***	1499.3**

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.3.3. Transportation

Table 5-18 describes time and cost to market (one way), condition of the roads (binary variable, which takes 1 if the condition is good), and availability in all seasons (binary variable, which takes 1 if available) for all households in the treatment and control groups. All indicators showed expected improvement (Table 5-19). For example, the time and cost to the nearest market were reduced by about 10 minutes and 4 pesos one way, respectively. These impacts are important for socio-economic activities since the number of beneficiaries of roads is larger than other facilities and roads have multidimensional functions related to basic social services like health and education. Similar impacts were confirmed for the low-education households (
Table 5-20 and Table 5-21).

Table 5-18　Access to Markets and Road Conditions: All Households

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Time to Market (Minutes)	735	38.10	735	49.90	-11.80***
Cost to Market (Pesos)	735	36.08	735	40.77	-4.69**
Access to Market in All Seasons (Yes=1)	735	0.766	735	0.603	0.163***
Good Conditions of Road to Market (Yes=1)	735	0.671	735	0.501	0.170***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-19　Impacts on Access to Markets and Road Conditions: All Households

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Time to Market (Minutes)	-10.10**	-10.42***	-9.34***	-9.11***
Cost to Market (Pesos)	-4.13	-4.13**	-3.26**	-3.97**
Access to Market in All Seasons (Yes=1)	0.130**	0.131***	0.120***	0.131***
Good Conditions of Road to Market (Yes=1)	0.141**	0.139***	0.136***	0.141***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-20   Access to Markets and Road Conditions: Low-Education Households

	Treatment		Control		Difference (t-test)
	N	Mean	N	Mean	
Time to Market (Minutes)	483	39.10	537	53.68	-14.58***
Cost to Market (Pesos)	483	35.47	537	43.3	-7.84***
Access to Market in All Seasons (Yes=1)	483	0.741	537	0.533	0.209***
Good Conditions of Road to Market (Yes=1)	483	0.646	537	0.458	0.188***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-21   Impacts on Access to Markets and Road Conditions:
Low-Education Households

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Time to Market (Minutes)	-10.66***	-10.46***	-10.32***	-12.20***
Cost to Market (Pesos)	-3.60	-5.30**	-5.73**	-6.96***
Access to Market in All Seasons (Yes=1)	0.166***	0.160***	0.164***	0.162***
Good Conditions of Road to Market (Yes=1)	0.142***	0.147***	0.154***	0.147***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.3.4. Education

Table 5-22 displays time to school and the existence of a school-aged child not enrolled in school (binary variable, which takes 1 if not enrolled). Although time to school was shortened by 3-8 minutes one way, there seemed to be no impact on enrollment (Table 5-23). However, for the low-education households, there was a roughly 5% reduction in the number of households who had a child not enrolled in elementary school (Table 5-24 and Table 5-25).

Table 5-22　Time to School and Enrollment: All Households

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Time to Kindergarten (Min.)	179	11.46	205	16.43	-4.97***
Time to Elementary School (Min.)	467	16.52	446	25.01	-8.48***
Time to Secondary School (Min.)	306	26.78	258	31.84	-5.06*
Any Child Not Enrolled in Kindergarten (Yes=1)	319	0.549	338	0.497	0.052
Any Child Not Enrolled in Elementary School (Yes=1)	501	0.100	480	0.142	-0.042**
Any Child Not Enrolled in Secondary School (Yes=1)	402	0.363	353	0.408	-0.045

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-23　Impacts on Time to School and Enrollment: All Households

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Time to Kindergarten (Min.)	-3.99*	-3.06*	-3.38*	-3.40*
Time to Elementary School (Min.)	-8.21**	-7.89***	-7.76***	-7.72***
Time to Secondary School (Min.)	-5.13	-4.26	-5.85*	-4.94*
Any Child Not Enrolled in Kindergarten (Yes=1)	0.057	0.058	0.066*	0.063
Any Child Not Enrolled in Elementary School (Yes=1)	-0.030	-0.024	-0.027	-0.028
Any Child Not Enrolled in Secondary School (Yes=1)	-0.030	-0.034	-0.04	-0.028

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-24 Time to School and Enrollment: Low-Education Households

	Treatment		Control		Difference (t-test)
	N	Mean	N	Mean	
Time to Kindergarten (Min.)	116	11.32	148	18.59	-7.27***
Time to Elementary School (Min.)	307	16.54	317	28.20	-11.66***
Time to Secondary School (Min.)	192	29.02	177	36.01	-6.70*
Any Child Not Enrolled in Kindergarten (Yes=1)	210	0.548	257	0.533	0.015
Any Child Not Enrolled in Elementary School (Yes=1)	332	0.117	349	0.166	-0.049*
Any Child Not Enrolled in Secondary School (Yes=1)	260	0.404	253	0.439	-0.035

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-25 Impacts on Time to School and Enrollment: Low-Education Households

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Time to Kindergarten (Min.)	-4.28**	-5.64***	-6.40***	-5.50**
Time to Elementary School (Min.)	-8.96***	-10.25***	-9.40***	-10.39***
Time to Secondary School (Min.)	-7.51*	-7.20*	-4.80**	-5.99
Any Child Not Enrolled in Kindergarten (Yes=1)	-0.000	0.020	0.032	0.019
Any Child Not Enrolled in Elementary School (Yes=1)	-0.041**	-0.049*	-0.048*	-0.037
Any Child Not Enrolled in Secondary School (Yes=1)	-0.060*	-0.055	-0.036	-0.048

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.3.5. Water and Sanitation

Table 5-26 shows indicators relating to access to water sources and toilets. It is confirmed in Table 5-27 that 6-10% of households in the treatment group had shifted their water source from a river or pond to a water system near their house, which helped them fetch water easily. Access to toilets was also improved by 12-14%. Similar benefits were observed for the low-education households, too, though the effect on difficulty in fetching water was not statistically significant (Table 5-28 and Table 5-29).

Table 5-26   Access to Water Sources and Toilets: All Households

Unit: Binary (Yes:1 or No:0)

	Treatment		Control		Difference (t-test)
	N	Mean	N	Mean	
Access to Water Systems	735	0.584	735	0.459	0.125***
Access to Rivers and Ponds	735	0.356	735	0.453	-0.097***
Access to Water Sources within 250m of Own House	735	0.620	735	0.540	0.080***
Difficulty in Fetching Water	735	0.576	735	0.667	-0.091***
Access to a Toilet	735	0.520	735	0.329	0.190***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-27   Impacts on Access to Water Sources and Toilets: All Households

Unit: Binary (Yes:1 or No:0)

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Access to Water Systems	0.099**	0.102***	0.104***	0.089***
Access to Rivers and Ponds	-0.066**	-0.067***	-0.065***	-0.055**
Access to Water Sources within 250m of Own House	0.077***	0.087***	0.072***	0.080***
Difficulty in Fetching Water	-0.069***	-0.065**	-0.068***	-0.066***
Access to a Toilet	0.125***	0.137***	0.139***	0.135***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-28　Access to Water Sources and Toilets: Low-Education Households

Unit: Binary (Yes:1 or No:0)

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Access to Water Systems	483	0.590	537	0.447	0.143***
Access to Rivers and Ponds	483	0.360	537	0.467	-0.107***
Access to Water Sources within 250m of Own House	483	0.598	537	0.523	0.075**
Difficulty in Fetching Water	483	0.623	537	0.685	-0.062**
Access to a Toilet	483	0.458	537	0.279	0.178***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-29　Impacts on Access to Water Sources and Toilets:
Low-Education Households

Unit: Binary (Yes:1 or No:0)

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Access to Water Systems	0.089**	0.105***	0.103***	0.093***
Access to Rivers and Ponds	-0.047	-0.051*	-0.045*	-0.044
Access to Water Sources within 250m of Own House	0.076**	0.052	0.060*	0.071**
Difficulty in Fetching Water	-0.047	-0.044	-0.033	-0.030
Access to a Toilet	0.128***	0.140***	0.152***	0.159***

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.3.6. Health

Table 5-30 lists time to health facilities (one way), experience of visiting a doctor in the last six months, and affectedness of fever and diarrhea in the same period. OLS and PSM estimators showed no impacts on visiting a doctor and health conditions, except for time to health facilities being reduced by 13-15 minutes (Table 5-31). These results were the same for low-education households (Table 5-32 and Table 5-33).

Table 5-30   Access to Health Facilities and Health Conditions: All Households

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Time to Health Facility (Min.)	732	29.48	735	42.68	-13.19***
Visit to Health Facility (Yes=1)	547	0.788	544	0.787	0.001
Any Sick Member (Persons)	735	0.743	735	0.741	0.001
Sick Member with a Fever (Persons)	735	0.465	735	0.431	0.034
Sick Member with Diarrhea (Persons)	735	0.178	735	0.163	0.015

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-31   Impacts on Access to Health Facilities and Health Conditions: All Households

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Time to Health Facility (Min.)	-12.52**	-15.54***	-12.61***	-13.23***
Visit to Health Facility (Yes=1)	-0.022	-0.022	-0.014	-0.018
Any Sick Member (Persons)	-0.008	-0.027	-0.026	-0.016
Sick Member with a Fever (Persons)	0.019	0.011	0.010	0.023
Sick Member with Diarrhea (Persons)	0.011	0.018	0.020	0.023

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-32   Access to Health Facilities and Health Conditions:
Low-Education Households

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Time to Health Facility (Min.)	482	30.09	537	46.37	-16.28***
Visit to Health Facility (Yes=1)	356	0.781	391	0.762	0.019
Any Sick Member (Persons)	483	0.737	537	0.730	0.007
Sick Member with a Fever (Persons)	483	0.468	537	0.438	0.030
Sick Member with Diarrhea (Persons)	483	0.178	537	0.160	0.018

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-33   Impacts on Access to Health Facilities and Health Conditions:
Low-Education Households

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Time to Health Facility (Min.)	-13.3***	-13.4***	-13.7***	-20.8***
Any Sick Member (Persons)	-0.018	-0.026	-0.014	-0.025
Sick Member with a Fever (Persons)	0.020	0.001	0.013	-0.002
Sick Member with Diarrhea (Persons)	0.010	0.017	0.015	0.015
Visit to Health Facility (Yes=1)	0.003	-0.002	0.002	0.003

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.3.7. Community Activities and Security

Table 5-34 displays attendance at community activities and village assemblies, affectedness by conflicts between clans (also known as "Rido") and other types of conflict, and experience of temporary escape from conflicts and/or disasters in the last 12 months. As shown in Table 5-35, it seems that conflicts between clans were slightly reduced by 3-4%. For other indicators, no effects were confirmed. Although these results were similar for the low-education households, some estimators implied an increase in community activities (Table 5-36 and **Table 5-37**).

Table 5-34   Attendance at Community Activities and Conflict Affectedness: All Households

Unit: Binary (Yes:1 or No:0)

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Attended Community Activities	735	0.118	735	0.095	0.023
Attended a Village Assembly	735	0.756	735	0.737	0.019
Affected by Conflicts between Clans	735	0.106	735	0.151	-0.045**
Affected by Any Other Conflict	735	0.078	735	0.098	-0.020
Escaped from Conflict or Disaster	735	0.110	735	0.124	-0.014

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-35   Impacts on Attendance at Community Activities and Conflict Affectedness: All Households

Unit: Binary (Yes:1 or No:0)

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Attended Community Activities	0.010	-0.005	-0.000	-0.003
Attended a Village Assembly	0.001	-0.002	-0.011	-0.003
Affected by Conflicts between Clans	-0.040	-0.039**	-0.036**	-0.032*
Affected by Any Other Conflict	-0.009	-0.012	-0.011	-0.022
Escaped from Conflict or Disaster	-0.001	-0.013	-0.005	-0.016

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-36   Attendance at Community Activities and Conflict Affectedness:
Low-Education Households

Unit: Binary (Yes:1 or No:0)

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
Attended Community Activities	483	0.110	537	0.074	0.035*
Attended a Village Assembly	483	0.739	537	0.706	0.033
Affected by Conflicts between Clans	483	0.118	537	0.162	-0.044**
Affected by Any Other Conflict	483	0.097	537	0.108	-0.011
Escaped from Conflict or Disaster	483	0.126	537	0.138	-0.012

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-37   Impacts on Attendance at Community Activities and Conflict Affectedness:
Low-Education Households

Unit: Binary (Yes:1 or No:0)

	OLS	PSM		
		NN(10)	NN(30)	Kernel
Attended Community Activities	0.028*	0.031	0.024	0.033*
Attended a Village Assembly	0.023	0.012	-0.002	0.020
Affected by Conflicts between Clans	-0.036*	-0.027	-0.026	-0.024
Affected by Any Other Conflict	-0.014	-0.014	-0.019	-0.013
Escaped from Conflict or Disaster	-0.008	-0.008	-0.013	-0.007

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

5.3.8. Trust

Table 5-38 shows trust in people belonging to the same or different social groups, village officials (i.e., village chairpersons), the local government, and the national government[5]. As shown in Table 5-39, some estimators indicated positive impacts of 3-5% on trust in people belonging to, for example, different clans and the same ethnicity. For trust in officials, opposite effects were observed between national government officials, who gained trust, and village chairpersons, who lost it. Similar results were confirmed for the low-education households, though the statistical significances of the estimators became weaker (Table 5-40 and Table 5-41).

Table 5-38 Trust in People and Officials: All Households

Unit: Binary (Yes:1 or No:0)

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
People in Same Community	735	0.976	735	0.978	-0.003
People in Different Communities	735	0.899	735	0.902	-0.003
People of Same Clan	735	0.986	735	0.981	0.005
People of Different Clans	735	0.835	735	0.805	0.030
People of Same Ethnicity	735	0.947	735	0.917	0.030**
People of Different Ethnicities	735	0.702	735	0.673	0.029
People of Same Religion	735	0.917	735	0.894	0.023
People of Different Religions	735	0.565	735	0.556	0.008
Village Chairperson	735	0.940	735	0.969	-0.029***
Local Government Officials	735	0.959	735	0.946	0.014
National Government Officials	735	0.921	735	0.897	0.024

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

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[5] It is not clear whether households recognized ARMM government officials as "local government officials" or "national government officials."

Table 5-39   Impacts on Trust in People and Officials: All Households

Unit: Binary (Yes:1 or No:0)

	OLS	PSM		
		NN(10)	NN(30)	Kernel
People in Same Community	0.001	-0.000	0.004	0.002
People in Different Communities	0.002	0.004	0.017	0.003
People of Same Clan	0.007	0.016*	0.014	0.012
People of Different Clans	0.035	0.041*	0.046**	0.032
People of Same Ethnicity	0.030*	0.043**	0.049***	0.038***
People of Different Ethnicities	0.022	0.034	0.043*	0.025
People of Same Religion	0.017	0.029	0.028*	0.02
People of Different Religions	0.006	0.039	0.03	0.021
Village Chairperson	-0.033	-0.026*	-0.029***	-0.027**
Local Government Officials	0.008	0.005	0.01	0.01
National Government Officials	0.026	0.034**	0.043**	0.033**

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-40   Trust in People and Officials: Low-Education Households

Unit: Binary (Yes:1 or No:0)

	Treatment		Control		Difference
	N	Mean	N	Mean	(t-test)
People in Same Community	483	0.977	537	0.981	-0.004
People in Different Communities	483	0.915	537	0.911	0.004
People of Same Clan	483	0.988	537	0.983	0.004
People of Different Clans	483	0.830	537	0.821	0.009
People of Same Ethnicity	483	0.948	537	0.926	0.023
People of Different Ethnicities	483	0.725	537	0.715	0.010
People of Same Religion	483	0.948	537	0.920	0.028*
People of Different Religions	483	0.586	537	0.587	-0.001
Village Chairperson	483	0.934	537	0.963	-0.029**
Local Government Officials	483	0.959	537	0.950	0.009
National Government Officials	483	0.928	537	0.920	0.008

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table 5-41　Impacts on Trust in People and Officials: Low-Education Households

Unit: Binary (Yes:1 or No:0)

	OLS	PSM		
		NN(10)	NN(30)	Kernel
People in Same Community	0.006	0.005	0.006	0.002
People in Different Communities	0.024*	0.028	0.017	0.012
People of Same Clan	0.008	0.012	0.006	0.008
People of Different Clans	0.031*	0.044*	0.031	0.023
People of Same Ethnicity	0.029**	0.037*	0.025	0.025
People of Different Ethnicities	0.028	0.022	0.016	0.000
People of Same Religion	0.021*	0.029	0.017	0.013
People of Different Religions	0.009	0.029	0.009	0.018
Village Chairperson	-0.016	-0.023	-0.028**	-0.019
Local Government Officials	0.011	0.014	0.009	0.007
National Government Officials	0.015	0.021	0.015	0.014

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

　　To investigate why a negative impact on trust in village chairpersons was observed, we divided the treatment group into households who thought they were utilizing the Project facilities and those who did not[6]. As shown in Table 5-42, households in the treatment group who thought they were *not* using Project facilities had less trust in village chairpersons than others. Therefore, one possible cause of the negative effect is that some treatment households who thought they could not benefit from the Project had complaints of unfairness against the village chairperson who was partially in charge of making the plans to construct the facilities.

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[6] It should be noted that the households' recognition is ambiguous and does not necessarily reflect actual utilization of facilities constructed through the Project. This is because some households may use Project facilities unconsciously and may regard facilities constructed by other projects as coming under the Project.

Table 5-42　Trust in Village Chairpersons

Unit: Binary (Yes:1 or No:0)

	N	Mean	Standard Deviation	Difference w/ Control (Tests of Proportion)
Control	735	0.969	0.174	N/A
Treat: Households who think they are using Project facilities	456	0.954	0.210	-0.015
Treat: Households who think they are not using Project facilities	279	0.918	0.276	-0.051***
Total	1470	0.954	0.209	N/A

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

6.　Conclusion and Discussion

This report investigated the socio-economic impacts of the ARMM Social Fund for Peace and Development Project in the Philippines, conducted from 2003 to 2012 through parallel financing by JICA, the World Bank, and CIDA. We focused on the primary component of the Project, which was construction and rehabilitation of small-scale infrastructure in selected disadvantaged villages using a CDD approach. Based on village- and household-level surveys conducted by JICA in 2015, the study reported the current utilization of facilities, subjective evaluations by beneficiaries, and a rigorous impact evaluation of the Project. In total, the results indicated that the Project led to various improvements in village-level outputs and household-level outcomes.

As for the current status of facilities, it was confirmed that more than 90% of facilities constructed by the Project are physically functional, adequately operated and maintained, and frequently utilized. The subjective evaluations by beneficiaries also revealed that more than 90% of village chairpersons and households are satisfied with the Project's outputs. In addition, approximately 40-50% of households answered that the Project had shown better performance in processes such as citizens' involvement, information disclosure, and conflict prevention than other development projects.

For the rigorous impact evaluation using socio-economic indicators, the village-level analysis with DID showed positive effects on the number of educational facilities

(kindergartens and elementary schools) and the percentage of citizens with access to toilets. Moreover, it found that the Project had a positive impact on local security, which means conflict was mitigated in treatment villages. This finding is contrary to the result of Crost et al. (2014), which indicates the sister project (KALAHI-CIDSS) in the Philippines had an unexpected negative effect, leading to more conflict casualties. However, we found no impacts on the number of health facilities and community groups.

The household-level analysis using PSM also showed improvements in various socio-economic indicators. First, income and consumption of treatment households were substantially increased in comparison with control households, especially for the low-education (and poor) households. Second, physical access to markets, schools, water systems, toilets, and health facilities was improved comprehensively thanks to the construction of roads and related infrastructure. Third, children's enrollment in elementary schools and attendance at community activities were slightly improved, though only for the low-education households. Fourth, among treatment households, some estimations showed reduced conflict between clans ("Rido") and increased trust in people belonging to, for example, the same ethnicity, different clans, and the national government, which implies the Project contributed to some aspects of social capital in the treatment villages.

On the other hand, there was no evidence of impacts on the frequency of doctor visits and health conditions. There may be at least two reasons for this. One is that the number of new health facilities constructed by the Project is very restricted, since the village-level analysis did not show any statistically significant effect. Another reason may be the limits of hard infrastructure, since health status cannot be improved just by building health facilities. The promotion of soft infrastructure, such as medical insurance and related institutions, also needs improvement.

Finally, a negative impact on trust in village chairpersons was detected. Trust was lower in treatment households who thought they were not utilizing Project facilities, which indicates a possibility that they had complaints of unfairness against village chairpersons partially in charge of planning the construction of facilities. Since it is difficult to construct facilities that all local citizens can benefit from, such unfairness may be an inevitable side effect of all kinds of infrastructure project. A further discussion on whether and how the CDD approach can mitigate such a negative impact is needed to expand similar projects in the future.

7. Appendix

Table A1   Estimation of Propensity Score: Logit and Probit Models

	(1) Logit Model	(2) Probit Model
	Treatment = 1	Treatment = 1
Ethnicity: Non-Maranao	-0.022	-0.009
(=1)	(0.152)	(0.094)
Religion: Non-Islam	-0.338	-0.214
(=1)	(0.232)	(0.144)
Num of household member	0.045**	0.028**
(person)	(0.021)	(0.013)
Duration of residence	0.001	0.000
(year)	(0.003)	(0.002)
Education of HH head:	-0.255**	-0.158**
Elementary & below (=1)	(0.128)	(0.079)
Education of HH head:	0.286	0.179
University & above (=1)	(0.250)	(0.154)
Residential structure:	0.329	0.198
Single (=1)	(0.395)	(0.240)
Residential structure:	0.169	0.109
Strong roof material (=1)	(0.179)	(0.110)
Residential structure:	0.297*	0.182*
Strong wall material (=1)	(0.160)	(0.099)
Residential structure:	-0.071	-0.045
Strong floor material (=1)	(0.131)	(0.081)
Owner of motorcycle	0.387**	0.243**
(=1)	(0.155)	(0.096)
Owner of car	0.678*	0.424*
(=1)	(0.368)	(0.221)
Owner of bicycle	0.174	0.107
(=1)	(0.246)	(0.150)
Rural area	0.567***	0.350***
(=1)	(0.135)	(0.083)
Population in the village	0.290***	0.178***
(log, person)	(0.097)	(0.060)
Cost of other projects	0.038*	0.024*
(log, pesos)	(0.023)	(0.014)
Constant	-3.463***	-2.130***
	(0.830)	(0.506)
N	1470	1470
pseudo R-sq	0.038	0.038

Source: Impact Survey of ASFPDP

Notes: IDP = internally displaced persons. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table A2　Impacts on Number of Schools in Villages: DID Estimation

	Model 1 (DID without Controls)			Model 2 (DID with Controls)		
	Pre-school	Element. School	Second. School	Pre-school	Element. School	Second. School
Treatment Effect	0.163**	0.177*	-0.068	0.180**	0.200**	-0.068
(Year X Treatment)	(0.074)	(0.094)	(0.044)	(0.076)	(0.096)	(0.044)
Year	0.386***	-0.090	0.071**	0.251**	-0.167	0.046
(2014=1)	(0.053)	(0.067)	(0.031)	(0.104)	(0.132)	(0.061)
Treatment	-0.044	-0.021	0.052	-0.048	-0.048	0.048
(=1)	(0.057)	(0.072)	(0.034)	(0.058)	(0.073)	(0.034)
Rural				0.037	0.097	-0.215***
(=1)				(0.075)	(0.095)	(0.044)
Coastal				0.131*	0.110	0.056
(=1)				(0.078)	(0.098)	(0.045)
Highland				0.022	0.050	-0.002
(=1)				(0.069)	(0.087)	(0.040)
Electricity				0.000	-0.000	0.000
(%)				(0.001)	(0.001)	(0.000)
Paved Road				-0.089*	-0.076	0.004
(=1)				(0.048)	(0.061)	(0.028)
Barangay Plan				0.081	0.195***	0.034
(=1)				(0.053)	(0.067)	(0.031)
Religion: Muslim				-0.243	0.332	-0.092
(%)				(0.280)	(0.353)	(0.163)
Ethnic: Maranao				0.263	-0.017	0.166
(%)				(0.290)	(0.366)	(0.169)
Ethnic: Maguindanao				0.095	-0.072	0.048
(%)				(0.282)	(0.356)	(0.164)
Ethnic: Iranon				0.102	-0.006	0.118
(%)				(0.339)	(0.428)	(0.198)
IDP: Outflow				-0.004	-0.008	-0.006
(log, person)				(0.010)	(0.012)	(0.006)
IDP: Inflow				-0.008	0.006	0.007
(log, person)				(0.010)	(0.013)	(0.006)
Cost of Other Project				0.016	-0.002	-0.001
(log, pesos)				(0.012)	(0.015)	(0.007)
Constant	0.679***	1.358***	0.057	0.563**	0.886***	-0.085
	(0.202)	(0.256)	(0.119)	(0.250)	(0.316)	(0.146)
Municipality FE	Yes	Yes	Yes	Yes	Yes	Yes
N	458	458	458	458	458	458
R-sq	0.323	0.170	0.098	0.333	0.189	0.135

Source: Impact Survey of ASFPDP

Notes: IDP: internally displaced persons. Robust standard errors clustered by municipality are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table A3　Impacts on Number of Health Facilities in Villages: DID Estimation

	Model 1 (DID without Controls)			Model 2 (DID with Controls)		
	Hospital	Rural Health Unit	Barangay Health Station	Hospital	Rural Health Unit	Barangay Health Station
Treatment Effect	0.006	-0.007	0.062	0.004	-0.004	0.058
(Year X Treatment)	(0.010)	(0.020)	(0.045)	(0.010)	(0.020)	(0.046)
Year	-0.010	0.013	0.027	-0.008	-0.017	0.116*
(2014=1)	(0.007)	(0.014)	(0.032)	(0.014)	(0.027)	(0.063)
Treatment	0.005	0.039**	0.061*	0.004	0.037**	0.061*
(=1)	(0.008)	(0.015)	(0.034)	(0.008)	(0.015)	(0.035)
Rural				-0.001	-0.025	-0.006
(=1)				(0.010)	(0.020)	(0.046)
Coastal				-0.027***	-0.027	-0.040
(=1)				(0.010)	(0.021)	(0.047)
Highland				-0.023**	-0.053***	0.010
(=1)				(0.009)	(0.018)	(0.042)
Electricity				-0.000	0.000	-0.000
(%)				(0.000)	(0.000)	(0.000)
Paved Road				0.013**	0.006	-0.002
(=1)				(0.006)	(0.013)	(0.029)
Barangay Plan				-0.002	0.000	0.005
(=1)				(0.007)	(0.014)	(0.032)
Religion: Muslim				0.172***	0.175**	0.011
(%)				(0.036)	(0.074)	(0.169)
Ethnic: Maranao				-0.188***	-0.215***	0.001
(%)				(0.038)	(0.076)	(0.175)
Ethnic: Maguindanao				-0.160***	-0.215***	0.164
(%)				(0.037)	(0.074)	(0.170)
Ethnic: Iranon				-0.149***	-0.198**	-0.059
(%)				(0.044)	(0.089)	(0.204)
IDP: Outflow				-0.001	-0.002	-0.009
(log, person)				(0.001)	(0.003)	(0.006)
IDP: Inflow				0.000	0.001	0.001
(log, person)				(0.001)	(0.003)	(0.006)
Cost of Other Project				0.000	0.004	-0.014*
(log, pesos)				(0.002)	(0.003)	(0.007)
Constant	0.001	0.253***	-0.059	0.037	0.324***	-0.054
	(0.027)	(0.054)	(0.122)	(0.033)	(0.066)	(0.151)
Municipality	Yes	Yes	Yes	Yes	Yes	Yes
N	458	458	458	458	458	458
R-sq	0.078	0.112	0.156	0.123	0.141	0.168

Source: Impact Survey of ASFPDP

Note: Robust standard errors clustered by municipality are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table A4   Impacts on Access to Water Sources and Toilets in Villages: DID Estimation

	Model 1 (DID without Controls)			Model 2 (DID with Controls)		
	Access to Water Systems (%)	Access to River & Pond (%)	Access to the Toilet (%)	Access to Water Systems (%)	Access to River & Pond (%)	Access to the Toilet (%)
Treatment Effect	0.589	-4.852	9.404**	0.700	-3.352	8.611**
(Year X Treatment)	(4.841)	(3.974)	(4.132)	(4.940)	(3.953)	(4.027)
Year	8.314**	4.672*	-1.117	10.465	-7.028	-10.545*
(2014=1)	(3.423)	(2.810)	(2.922)	(6.770)	(5.417)	(5.519)
Treatment	-2.004	2.992	-3.445	-1.277	2.666	-4.991
(=1)	(3.696)	(3.034)	(3.154)	(3.778)	(3.023)	(3.079)
Rural				-11.641**	9.563**	-6.907*
(=1)				(5.089)	(4.072)	(4.148)
Coastal				-5.354	13.905***	-2.584
(=1)				(5.074)	(4.060)	(4.136)
Highland				5.729	-3.817	-7.569**
(=1)				(4.491)	(3.593)	(3.660)
Electricity				-0.022	0.112***	-0.013
(%)				(0.050)	(0.040)	(0.041)
Paved Road				-3.510	0.880	11.551***
(=1)				(3.140)	(2.513)	(2.560)
Barangay Plan				-2.771	-0.237	11.739***
(=1)				(3.453)	(2.763)	(2.815)
Population				-1.282	-1.782	7.324***
(ln)				(2.776)	(2.222)	(2.263)
Religion: Muslim				-3.848	18.230	-12.268
(%)				(18.179)	(14.546)	(14.818)
Ethnic: Maranao				15.706	14.628	28.544*
(%)				(18.821)	(15.060)	(15.341)
Ethnic: Maguindanao				3.980	-7.377	-9.562
(%)				(18.306)	(14.648)	(14.921)
Ethnic: Iranon				25.494	-6.619	11.345
(%)				(22.009)	(17.611)	(17.939)
IDP: Outflow				-0.031	0.793	-0.143
(log, person)				(0.627)	(0.502)	(0.511)
IDP: Inflow				-0.296	-0.071	-0.967*
(log, person)				(0.672)	(0.537)	(0.547)
Cost of Other Project				0.062	0.533	0.219
(log, pesos)				(0.788)	(0.631)	(0.642)
Constant	31.073**	49.881***	73.680***	36.009	19.680	0.515
	(13.138)	(10.784)	(11.213)	(24.962)	(19.974)	(20.346)
Municipality	Yes	Yes	Yes	Yes	Yes	Yes
N	458	458	458	458	458	458
R-sq	0.356	0.300	0.355	0.371	0.349	0.424

Source: Impact Survey of ASFPDP

Note: Robust standard errors clustered by municipality are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Table A5　Impacts on Community Activities and Conflicts in Villages: DID Estimation

	Model 1 (DID without Controls)			Model 2 (DID with Controls)		
	All Community Groups	Active Community Groups	Conflicts	All Community Groups	Active Community Groups	Conflicts
Treatment Effect	0.088	-0.006	-1.310***	0.112	-0.000	-1.098***
(Year X Treatment)	(0.122)	(0.068)	(0.297)	(0.122)	(0.068)	(0.290)
Year	0.730***	0.173***	2.014***	0.151	-0.125	1.662***
(2014=1)	(0.086)	(0.048)	(0.223)	(0.167)	(0.094)	(0.376)
Treatment	-0.068	-0.037	0.450*	-0.110	-0.044	0.454*
(=1)	(0.093)	(0.052)	(0.245)	(0.093)	(0.052)	(0.249)
Rural				0.260**	0.117*	-0.436
(=1)				(0.121)	(0.068)	(0.307)
Coastal				0.172	0.017	-0.367
(=1)				(0.125)	(0.070)	(0.286)
Highland				0.163	0.022	-0.076
(=1)				(0.111)	(0.062)	(0.231)
Electricity				0.000	0.000	0.009***
(%)				(0.001)	(0.001)	(0.003)
Paved Road				-0.020	0.012	0.038
(=1)				(0.077)	(0.044)	(0.181)
Barangay Plan				0.383***	0.092*	0.040
(=1)				(0.085)	(0.048)	(0.194)
Religion: Muslim				-0.337	-0.272	-1.217
(%)				(0.449)	(0.253)	(1.136)
Ethnic: Maranao				0.787*	0.540**	1.031
(%)				(0.465)	(0.262)	(1.240)
Ethnic: Maguindanao				0.355	0.067	1.623
(%)				(0.452)	(0.255)	(1.104)
Ethnic: Iranon				0.557	0.457	3.223**
(%)				(0.544)	(0.306)	(1.504)
IDP: Outflow				-0.005	0.000	0.311***
(log, person)				(0.015)	(0.009)	(0.033)
IDP: Inflow				0.027	0.007	0.073**
(log, person)				(0.017)	(0.009)	(0.033)
Cost of Other Project				0.057***	0.035***	-0.020
(log, pesos)				(0.019)	(0.011)	(0.041)
Constant	2.088***	0.805***	-18.273	1.407***	0.542**	-14.727
	(0.331)	(0.184)	(1805.504)	(0.401)	(0.226)	(447.067)
Municipality Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
N	458	458	458	458	458	458
R-sq	0.270	0.229	0.131	0.312	0.257	0.184

Source: Impact Survey of ASFPDP

Notes: Robust standard errors clustered by municipality are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. A negative binomial model was employed for the regression of "conflicts" since we used over-dispersed count data.

Table A6   Estimation of Propensity Score: Logit and Probit Models

	(1) Logit Model	(2) Probit Model
	Treatment (=1)	Treatment (=1)
Ethnicity: Non-Maranao (=1)	-0.022	-0.009
	(0.152)	(0.094)
Religion: Non-Islam (=1)	-0.338	-0.214
	(0.232)	(0.144)
Num of household member (person)	0.045**	0.028**
	(0.021)	(0.013)
Duration of residence (year)	0.001	0.000
	(0.003)	(0.002)
Education of HH head: Elementary & below (=1)	-0.255**	-0.158**
	(0.128)	(0.079)
Education of HH head: University & above (=1)	0.286	0.179
	(0.250)	(0.154)
Residential structure: Single (=1)	0.329	0.198
	(0.395)	(0.240)
Residential structure: Strong roof material (=1)	0.169	0.109
	(0.179)	(0.110)
Residential structure: Strong wall material (=1)	0.297*	0.182*
	(0.160)	(0.099)
Residential structure: Strong floor material (=1)	-0.071	-0.045
	(0.131)	(0.081)
Owner of motorcycle (=1)	0.387**	0.243**
	(0.155)	(0.096)
Owner of car (=1)	0.678*	0.424*
	(0.368)	(0.221)
Owner of bicycle (=1)	0.174	0.107
	(0.246)	(0.150)
Rural area (=1)	0.567***	0.350***
	(0.135)	(0.083)
Population in the village (log, person)	0.290***	0.178***
	(0.097)	(0.060)
Cost of other projects (log, pesos)	0.038*	0.024*
	(0.023)	(0.014)
Constant	-3.463***	-2.130***
	(0.830)	(0.506)
N	1470	1470
Pseudo R-sq	0.038	0.038

Source: Impact Survey of ASFPDP

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

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