

Online Appendix for

**Organization of Disaster Aid Delivery: Spending Your Donations**

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## **1. Introduction**

This appendix provides additional description of the data, methodology, and results for our paper “Organization of Disaster Aid Delivery: Spending Your Donations”. In Section 2, we describe the survey in more detail. In Section 3, we provide detailed information on all house and boat aid agencies that appear in our sample and their classification based on the organizational structure. In Section 4, we describe the overview of the destruction from tsunami in more detail. In Section 5, we present the results from the ordered logistic regressions corresponding to Tables 3 and 4 of the paper. In Section 6, we describe the estimation procedure used in Table 7 of the paper.

## **2. The Survey**

The village surveys in summer and fall 2005, fall 2007 and fall 2009 ask questions about education, experience, and survival of village and religious leaders; population composition by sex and age both before and after the tsunami; migration; occupational structure; destruction of village lands, seawalls, aquaculture areas, docking areas and mangroves; pre- and post-tsunami data on political, legal, and social institutions; pre and post tsunami information on physical capital (houses, boats, public buildings); detailed information on initial and ongoing operations of NGOs, local governments, and relief agencies providing housing, boats, public buildings and restoration of the coast line; and detailed information on the village fishing industry pre- and post-tsunami, including questions on marketing, fishing fleet composition, catch composition and boat replacement. The 2005 survey of 111 villages focused on benchmarking destruction and village conditions. The 2007 and 2009 surveys of 199 villages (including the original 111) focused on aspects of the aid effort and institutional transformation of villages, such as the democratic evolution and quality of aid as related to different types of aid agencies.

The fishermen surveys ask about family structure, occupations, social status, income and aspect of debt and wealth, housing and boat destruction and aid, fishing productivity, and family participation in village activities. The 2005 survey focused on 475 original boat owners and captains in 77 villages (about 40% of surviving captains and owners in those villages), benchmarking family destruction of people, housing and boats, as well as pre-tsunami productivity. The 2007 and 2009 surveys follow these families, marking their rebuilding of families, new occupational choices, aid received, re-establishment or not of fishing activities, and evolving family participation in village life. In the second wave as followed in the third, besides the original families we extended village coverage and added a module for new boat owners—villagers given an aid boat who had never owned a boat. In the second wave (2007) we have about 700 families in 96 villages and in the third wave (2009) after some sorting and attrition we drop coverage to about 635 fishing families in 90 villages. Here our focus is on the quality of aid received and response to low quality boat aid.

### **3. Aid Agencies**

Table 3.1 and 3.2 give detailed data on housing quality of individual agencies providing housing in our villages. Table 3.1 lists all agencies that operate in two or more villages; many are well known agencies. Those who operate in only one village are listed in Table 3.2. For each implementer, the table gives number of houses provided, number of villages involved, and average ratings by the village head. For international and domestic implementers, we list in brackets the donor agencies often associated with the implementing agency. Some village heads report the funding agency but not the domestic-implementer working on the ground. In this case, we list the funding agency associated with the anonymous domestic implementer. For the smaller set of villages where fishermen report in the sample, we list the average count of faults associated with the relevant implementer. For village heads, we think an average rating near or below 2.5 isn't good and ratings at 2 or below are bad. Clearly, most domestic implementers as well as BRR have relatively low village head ratings and higher counts of faults, but some international agencies do as well. For counts of faults, there is a sharp divide with international agencies scoring below 1 and domestic ones over 1 in general.

From the village level data as reported in 2007, Table 3.3 provides a list of individual boat agencies operating in 2 or more villages and Table 3.2 in one village. The tables give the number of boats in aid, villages, and the initial failure rate. We cannot identify comprehensively implementer type for boats, because most boat aid is not reported in the RAN database. Later we will utilize the few NGOs that can be typed as boat donor-implementers in the empirical work. As such implementer type is not the focus in our analysis of boat aid, but rather a particular social agenda discussed below. Still it is instructive to see the failure rates by agency. NGOs like Oxfam, International Medical Corps, and certain foreign governments like France, Kuwait, and the Japan International Cooperation Agency have appalling records of reported boat failure. Clearly there is a failure of many implementers to enforce construction or material standards in dealing with the boat workshops. Some agencies got good boats and others shoddy ones from the same workshop.

**Table 3.1 House agencies operating in more than one village**

Name of housing agency	Type	No. of village projects	No. of houses	Village Head reports		Fishermen reports	
				Mean quality	Mean quality (weighted)	Mean count of faults	No. of fishermen
Canadian Red Cross	Donor-Imp.	10	1758	3.00	3.00	0.81	27
German Information Technology Executive Council(GITEC) <sup>1</sup>	Donor-Imp.	4	856	3.00	3.00	0.78	9
World Vision International	Donor-Imp.	11	1977	2.73	2.89	0.67	12
Spanish Red Cross	Donor-Imp.	2	250	2.75	2.84		
UN	Donor-Imp.	14	2087	2.82	2.83	0.50	6
Catholic Relief Service	Donor-Imp.	18	2282	2.89	2.83	0.00	12
British Red Cross	Donor-Imp.	8	1247	2.63	2.82	0.43	7
German Red Cross	Donor-Imp.	4	652	2.75	2.78		
Turkey <sup>2</sup>	Donor-Imp.	8	842	2.50	2.58	0.83	23
Australian Red Cross	Donor-Imp.	6	493	2.58	2.49		
CARE	Donor-Imp.	3	544	2.17	2.40		
Samaritan's Purse	Donor-Imp.	5	1232	2.30	2.05		
Save the Children	Donor-Imp.	2	75	1.50	1.93		
Concern Worldwide	Donor-Imp.	2	9	1.00	1.00		
GenAssist/CRWRC [Tearfund UK, Mennonite Central Committee]	Int'l Imp.	10	398	2.60	2.93	0.33	3
International Organization for Migration [Various Governments]	Int'l Imp.	5	328	2.70	2.93		
CHF International [Direct Relief International, USAID]	Int'l Imp.	7	380	2.86	2.84	0.00	2
Emergency Architects [French Red Cross, French Government]	Int'l Imp.	3	325	2.83	2.69		
Oxfam [UK Disaster Emergency Committee]	Int'l Imp.	9	514	2.67	2.66	0.89	18
Habitat for Humanity Indonesia [Mercy Corps International]	Int'l Imp.	13	1392	2.62	2.57		
Church World Services [ACT Alliance]	Int'l Imp.	2	192	2.00	2.00		
Muslim Aid Indonesia [Oxfam]	Int'l Imp.	6	390	2.33	1.92		
KOMPAK <sup>s</sup>	Domestic Imp.	8	599	2.88	2.92		
Caritas <sup>d</sup>	Domestic Imp.	5	890	2.60	2.90		
Education and Information Center for Child Rights(KKSP) [Terre des Hommes]	Domestic Imp.	3	600	2.67	2.77		
Indonesian Government Agencies <sup>d</sup>	Domestic Imp.	5	842	2.30	2.64		
Diakonie Emergency Aid [Katahati Institute]	Domestic Imp.	3	97	2.67	2.53		
United Methodist Committee on Relief <sup>d</sup>	Domestic Imp.	3	31	2.67	2.52		
Uplink Indonesia [Canadian Government]	Domestic Imp.	8	1390	2.44	2.42	1.23	31
Asian Development Bank <sup>d</sup>	Domestic Imp.	5	388	2.40	2.37	0.40	5
SOS Desa Taruna Indonesia [SOS Kinderdorf International]	Domestic Imp.	3	520	2.33	2.23	1.13	32
Aceh Relief Fund [Compassion International]	Domestic Imp.	4	198	1.38	1.69	3.00	4
Salam Aceh <sup>s</sup>	Domestic Imp.	2	172	1.50	1.68	1.75	8
MAMAMIA [Caritas]	Domestic Imp.	6	1068	1.42	1.33	1.50	16
Serambi Kasih/Serasih Indonesia <sup>s</sup>	Domestic Imp.	2	177	1.50	1.25	1.50	2
Nor Link/North Link [World Relief]	Domestic Imp.	2	66	1.00	1.00	2.36	14
BRR	BRR	112	7241	2.33	2.32	1.45	86

Notes: For international and domestic implementers the main donor agencies are listed in brackets.

d. Agencies named by the village head that are primarily donor agencies. In this case, implementing agencies are domestic implementers unnamed by the village head.

s. Agencies named in the survey by the village head but that does not show up in the RAN database.

1. GITEC includes the German Technical Cooperation (GTZ) and the German Development Bank (KfW)

2. Turkey includes ABS Turkey, the Istanbul International Brotherhood and Solidarity Association (IBS), and the Turkish Red Crescent

**Table 3.2 House NGOs operating in one village**

Name of housing agency	Type	No. of village projects	No. of houses	Village Head reports		Fishermen reports	
				Mean quality	Mean quality (weighted)	Mean count of faults	No. of fishermen
Yayasan Budha Tzu Chi	Donor-Imp.	1	850	3.00	3.00	1.33	3
Islamic Relief	Donor-Imp.	1	668	3.00	3.00	0.00	4
Indonesia Red Cross	Donor-Imp.	1	401	3.00	3.00	1.00	2
Yayasan Budha Suci	Donor-Imp.	1	241	3.00	3.00		
The Salvation Army	Donor-Imp.	1	109	3.00	3.00		
Brunei Darussalam	Donor-Imp.	1	70	3.00	3.00		
Terre des Hommes	Donor-Imp.	1	48	3.00	3.00	3.00	5
World Relief	Donor-Imp.	1	42	3.00	3.00	0.00	3
Qatar	Donor-Imp.	1	170	2.50	2.50	2.00	1
Bakrie Group	Donor-Imp.	1	204	2.00	2.00	1.33	3
CARDI/NRC(Norwegian Refugee Council)	Donor-Imp.	1	202	2.00	2.00		
Chamber of Commerce and Industry of Indonesia(KADIN)	Donor-Imp.	1	100	1.00	1.00	0.00	3
Atlas Logistique	Int'l Imp.	1	274	3.00	3.00	0.00	6
Islamic Development Bank	Int'l Imp.	1	167	3.00	3.00		
Jesuit Refugee Services	Int'l Imp.	1	106	3.00	3.00		
Sara Henderson	Int'l Imp.	1	51	2.00	2.00		
Sinohidro China	Domestic Imp.	1	606	3.00	3.00	0.00	2
P2KP (Program Penanggulangan Kemiskinan di Perkotaan)	Domestic Imp.	1	400	3.00	3.00		
Lion's Club	Domestic Imp.	1	250	3.00	3.00		
GAA and Hivos funds	Domestic Imp.	1	184	3.00	3.00		
Welthungerhilfe	Domestic Imp.	1	174	3.00	3.00		
Yayasan Sosial Kreasi	Domestic Imp.	1	118	3.00	3.00		
YAKKUM Emergency Unit	Domestic Imp.	1	118	3.00	3.00		
Plan International	Domestic Imp.	1	96	3.00	3.00		
Yayasan Tanggul Bencana di Indonesia	Domestic Imp.	1	38	3.00	3.00		
Yayasan SHEEP	Domestic Imp.	1	31	3.00	3.00		
World Bank	Domestic Imp.	1	309	2.50	2.50		
Chinese Red Cross	Domestic Imp.	1	300	2.50	2.50	0.00	1
Kuwait	Domestic Imp.	1	2	2.50	2.50		
The Saudi Charity Campaign	Domestic Imp.	1	256	2.00	2.00	0.60	10
Yayasan Berkati Indonesia	Domestic Imp.	1	90	2.00	2.00	2.00	4
CORDIA Medan	Domestic Imp.	1	72	2.00	2.00		
Soroptimist International of Jakarta	Domestic Imp.	1	220	1.00	1.00	1.00	3
Mercy Corps (several)	Domestic Imp.	1	200	1.00	1.00	2.00	1

**Table 3.3 Boat agencies operating in more than one village**

Name of boat agency	No. of village projects	No. of boats provided	Failure rate	Failure rate (weighted)
Mercy Corps (several)	8	177	0	0
Church World Services	5	82	0	0
Samaritan's Purse	3	55	0	0
CARDI/NRC(Norwegian Refugee Council)	5	43	0	0
CHF International	3	32	0	0
Asian Development Bank	9	25	0	0
TRIKONI	2	24	0	0
Yayasan Tanggul Bencana di Indonesia	2	22	0	0
Yayasan Panglima Laot	5	18	0	0
Austin International Rescue Operation	4	15	0	0
Padi Nusantara (California Origin)	2	11	0	0
Oman	3	8	0	0
GenAssist/CRWRC	2	3	0	0
International Red Cross	11	67	0.09	0.01
Triangle Generation Humanitaire	38	502	0.17	0.08
Salam Aceh - Greeting Aceh	10	131	0.12	0.12
Austrian Tourism Export Council	3	52	0.33	0.15
Government <sup>1</sup>	50	326	0.31	0.19
World Vision International	6	31	0.17	0.32
BRR	9	21	0.50	0.38
Rumah Zakat Indonesia	3	7	0.33	0.43
International Medical Corps	15	101	0.50	0.50
Japan International Cooperation Agency	2	9	0.50	0.56
Kuwait	5	42	0.62	0.57
Africa Islamic AL-AMIN	3	19	0.72	0.58
France	2	36	0.50	0.83
Oxfam	6	215	0.42	0.84
Yayasan PUGAR	3	19	0.67	0.95
Serambi Kasih/Serasih Indonesia	2	10	1	1

Notes: 1. Government includes various Indonesian government agencies including the Ministry of Fishing Affairs.

**Table 3.4 Boat agencies operating in one village**

Name of boat agency	No. of village projects	No. of boats provided	Failure rate	Failure rate (weighted)
German Information Technology Executive Council(GITEC) <sup>1</sup>	1	50	0	0
Catholic Relief Service	1	35	0	0
Saragih (rich person)	1	34	0	0
Tearfund	1	17	0	0
Yayasan Sosial Kreasi	1	10	0	0
CARE	1	8	0	0
Yayasan Berkati Indonesia	1	7	0	0
Aceh Relief Fund	1	6	0	0
AUSTCARE	1	6	0	0
ACTED - Agency for Technical Cooperation	1	5	0	0
YPK	1	5	0	0
Personal Aid	1	3	0	0
Save the Children	1	2	0	0
British Red Cross	1	1	0	0
Obor Berkati Indonesia	1	1	0	0
YJK	1	1	0	0
Diantama (Rich Person)	1	5	0.20	0.20
World Relief	1	25	0.40	0.40
UN	1	50	0.50	0.50
Food and Agricultural Organization	1	9	0.89	0.89

Notes: 1. GITEC includes the German Technical Cooperation (GTZ) and the German Development Bank (KFW)

#### 4. Overview of the destruction.

Table 4 presents an overview of destruction in our villages, using official numbers on pre and post-tsunami populations and household counts to increase coverage. We believe our survey numbers for 111 villages in 2005 are more accurate in portraying pre and post tsunami village populations than official numbers for reasons detailed in Freire, Henderson, and Kuncoro (2011). Official numbers seem to modestly undercount surviving populations. Survey numbers for the 88 added villages in 2007 on pre and post tsunami populations suffer from the fact that by then most village heads had been replaced and recollections on pre-tsunami numbers are noisy. Table 4 gives summary statistics for the 190 villages where we have complete information for both 2007 and 2009. Our survey counts of houses and public buildings pre- tsunami are fairly accurate given the village mapping exercises conducted soon after the tsunami, in the physical presence of remaining foundations. Boats are another matter since there is no written record of pre-tsunami boats nor physical evidence of what was destroyed. By 2007 villages tend to heavily exaggerate boats lost. We only report on villages surveyed in 2005, where we record boat, captain, and owner survival status.

**Table 4. Destruction of population and housing**

<b>Survival</b>	
Pre-tsunami population <sup>a</sup>	171783 (official)
<b>Survival rate of population</b> <sup>b</sup> [original 05 villages, 104 covered]	<b>65%</b> [49%]
Post-tsunami households, official	32876
<b>House aid</b>	
Number of houses survive tsunami, survey	5399
<b>Survival rate houses</b>	<b>9%</b>
Number of temporary aid houses built ('07 survey)	6529
Number of permanent aid houses built ('07 survey)	32277
<b>Replacement rate by late 2007</b> <sup>c</sup>	<b>117%</b>
Number of permanent aid houses built by late 2009	39899
<b>Other aid</b>	
<b>Survival rate public buildings</b>	<b>6%</b>
<b>Replacement rate, public buildings by late 2007</b>	<b>80%</b>
Replacement rate, public buildings by late 2009	96%
<b>Survival rate of boats</b> [ '05 sample of villages]	<b>[6%]</b>
<b>Replacement rate, boats [2007 survey for 96 villages surveyed in '05]</b> <sup>d</sup>	<b>[105%]</b>

Note: Based on 190 villages where there is both 2007 and 2009 information

- Official population counts pre-tsunami are from the P4B, a 2004 government pre-election census.
- The official survival rate is the 2006 PODES count divided by the count in P4B. The PODES is a tri-annual government inventory of village populations and facilities. The 2006 PODES in Aceh was conducted in the Spring 2005. It has lower counts of population and households compared to our 2005 survey (Summer and Fall, 2005). This may be partly a "9/11 phenomenon"; as time goes on more missing families are discovered.
- The replacement rate is the number of houses given in aid divided by the number of surviving households less the number of surviving houses. Includes mosques, village halls, fishermen halls, public and Islamic elementary schools, health facilities.
- Defined as boats on water by late 2007/surviving captains 2005.



## 5. Ordered Logistic Regressions

**Table 5.1 Quality of Housing**

Dependent Variable:	Subjective Quality						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln(no. households post-tsunami)	0.104 (0.187)	0.102 (0.187)	0.110 (0.184)	0.131 (0.187)	0.102 (0.187)	0.313 (0.306)	
Survival rate population	-0.259 (0.272)	-0.323 (0.300)	-0.387 (0.303)	-0.407 (0.308)	-0.352 (0.306)	-0.377 (0.358)	
Mullah survive	0.313 (0.295)	0.327 (0.293)	0.444 (0.312)	0.436 (0.312)	0.401 (0.311)	0.233 (0.386)	
Pre-tsunami arisan group	0.277 (0.293)	0.233 (0.289)	0.204 (0.297)	0.188 (0.289)	0.130 (0.285)	0.248 (0.297)	
Ln(distance to Banda Aceh)	0.443 (0.297)	0.405 (0.295)	0.329 (0.299)	0.363 (0.293)	0.439 (0.289)	0.173 (0.855)	
Ln(no. houses destroyed)	-0.00939 (0.118)	-0.0273 (0.114)	-0.0420 (0.112)	-0.0456 (0.113)	-0.0507 (0.116)	-0.145 (0.155)	
Village head survive and in office					-0.164 (0.290)		
Current village head graduated high school					0.299 (0.264)		
Provider: Donor-Implementer		0.904*** (0.289)					
x 1st project			1.411*** (0.431)	1.417*** (0.429)	1.498*** (0.452)	1.522*** (0.486)	1.602*** (0.383)
x 2nd project			-0.290 (0.447)				
x 3rd project			1.120 (0.970)				
x 2nd or 3rd project				0.00985 (0.459)	-0.0304 (0.460)	-0.0280 (0.470)	0.285 (0.457)
Provider: International Implementer		0.885*** (0.323)					
x 1st project			1.040* (0.620)	1.044* (0.615)	1.039* (0.621)	1.263* (0.737)	1.086* (0.560)
x 2nd project			0.934* (0.542)				
x 3rd project			0.867 (0.562)				
x 2nd or 3rd project				0.913** (0.441)	0.914** (0.450)	0.887* (0.490)	0.929** (0.412)
Provider: Domestic Implementer		-0.0207 (0.320)					
x 1st project			-0.486 (0.508)	-0.482 (0.501)	-0.427 (0.506)	-0.633 (0.516)	-0.420 (0.481)
x 2nd project			0.346 (0.488)				
x 3rd project			0.781 (0.511)				
x 2nd or 3rd project				0.483 (0.418)	0.511 (0.420)	0.420 (0.461)	0.430 (0.391)
Provider: BRR x 2nd project			0.226 (0.432)				
x 3rd project			-0.310 (0.489)				
x 2nd or 3rd project				0.0774 (0.395)	0.142 (0.415)	0.268 (0.417)	0.166 (0.360)
Kabupaten fixed effects	Yes	Yes	Yes	Yes	Yes		
Kecamatan fixed effects						Yes	
Observations	322	322	322	322	322	322	341

Notes: Robust standard errors clustered at the village level are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 5.2 Donor-implementer quality shading, robustness to composition of NGOs**

Dependent Variable:	Subjective Quality		
	(1)	(2)	(3)
Provider: Donor-Imp. x 1st project	2.367*** (0.553)	2.084*** (0.642)	2.557* (1.419)
x ratio of others	-4.752*** (1.292)	-3.759** (1.515)	-4.079** (1.806)
x 2nd or 3rd project	-0.0143 (0.459)	0.00674 (0.463)	1.647 (1.218)
Provider: Int'l Imp. x 1st project	1.102* (0.613)	1.142* (0.618)	15.78*** (1.492)
x 2nd or 3rd project	0.886** (0.449)	0.883* (0.458)	1.766 (1.679)
Provider: Dom Imp x 1st project	-0.523 (0.508)	-0.531 (0.507)	0.928 (1.519)
x 2nd or 3rd project	0.387 (0.421)	0.374 (0.422)	2.072 (1.406)
Provider: BRR x 2nd or 3rd proj	0.0247 (0.400)	-0.189 (0.401)	0.323 (1.649)
Kabupaten fixed effects	Yes	Yes	Yes
Observations	322	299	106

Notes: All specifications include village characteristics variables as in Table 3. Robust standard errors clustered at the village level are in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## 6. Estimation procedure for Table 7 of the paper

We estimate the selection bias under the assumption that the selection on unobservables is equal to the selection on observables by adapting Altonji et al. (2005) to the multinomial treatment case. We consider the following linear regressions where  $T_J$  ( $J=1,2,3$ ) represents the three implementer types,  $X$  the covariates, and  $y$  house quality, our outcome of interest.

$$y = \sum_J \alpha_J T_J + X\gamma + \varepsilon \quad (1)$$

$$T_J = X\beta_J + u_J \quad (2)$$

Now consider the linear regressions of the treatment variables on the observed and unobserved components in (1)

$$T_J = c_J + \varphi_J X\gamma + \delta_J \varepsilon + e_J \text{ for } J=1,2,3.$$

The condition that the selection on unobservables equals the selection on observables implies  $\varphi_J = \delta_J$  in the above, which can be expressed as

$$\frac{\text{Cov}(\varepsilon, u_J)}{\text{Var}(\varepsilon)} = \frac{\text{Cov}(X\gamma, X\beta_J)}{\text{Var}(X\gamma)} \quad (3).$$

Next, to understand the role of selection bias, we combine equations (1) and (2) to get

$$y = \alpha_1 u_1 + \alpha_2 u_2 + \alpha_3 u_3 + X(\alpha_1 \beta_1 + \alpha_2 \beta_2 + \alpha_3 \beta_3 + \gamma) + \varepsilon$$

and under the simplifying assumption that  $\text{Cov}(u_i, u_j)=0$ ,

$$\widehat{\alpha}_J = \alpha_J + \frac{\text{Cov}(u_J, \varepsilon)}{\text{Var}(u_J)} \quad (4)$$

for  $J=1,2,3$ . The second term in the right hand side of equation (4) is the bias term which we can estimate using the condition in equation (3). These estimates are reported in row 2 of Table 7. Based on this we can ask, assuming that there is no agency effect ( $\alpha_J = 0$ ), how large the left hand side of equation (3) relative to the right hand side has to be to explain away the estimated impact we find under OLS. In other words, we take the ratio of the OLS estimate in equation (1) and divide it by the bias term in (4). These ratios are reported in row 3 of Table 7.