El Salvador Housing damage assessment analysis after tropical depression E12

San Salvador, 2 de diciembre de 2011

https://www.shelftercluster.org/Americas/ElSalvador/ElSalvadorFloods2011/

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1. Introduction

El Salvador was flooded caused by heavy rains for ten days s from 10th to 18th October. 59,000 persons were evacuated from their houses. 681 Collective centers hosted 56,000 persons.

Once rains stopped, floods were reduced very fast and quick population return process was produced.

2. Assessments

2.1. Collective Centers Assessment

During ten the days the populations were hosted in the collective centers, a household survey was done. Destroyed houses, damaged houses and On High risk were the options included into the survey. This survey provided quick information but some biases are included detailed as follow:

- Populations answering the survey are displaced; in some cases many kilometers away from their area of origin.
- Damaged houses and Housing at High Risk are not well defined within the Survey, on the surveys takers and those polled, houses affected but can be mitigated has been included within High Risk.
- Damage caused by floods is often not perceptible just through observation; water level usually needs to decrease followed by a specialized assessments.
- Evaluation of housing at High Risk had bias and flood and landslides characteristics, following different model than others disasters, caused that damaged houses were considered on High Risk.
- Several isolated areas and others where the Collective centers network was not enough to hosted displaced population are out of the scope of the survey, mainly as the areas that are not often flooded.
- Self settled Displaced people and those hosted with families and relatives are out of the scope the survey.

On the other side this methodology has several advantages and added values:

- It is a quick method due is focused on the collective centers.
- It is based on the municipalities and Civil Defense network, that has a wide geographical coverage and human resources.
- Traditional lower impact areas where indentified.
- Established an initial (rapid) housing damage map.

2.2.International and national shelter cluster partners

National and International shelter cluster partners focused on the traditional impact areas during the days after the floods. Nevertheless due the mitigations activities taken after Ida and Agatha hurricanes and changes on the models of the floods, damages were not concentrated in these areas and extended geographically and to difficult access remote areas.

Changes on the models and not enough resources on the field caused not systematic assessments and geographically limited assessments. Assessor's skills and assessment criteria have not been equal.

As consequence, figures received have been heterogeneous and incomplete, so these assessments cannot be a reference, just information to complete or validate other assessments.

High figures of displaced population on collective centers distract the focus on housing damages.

2.3.VMVDU-MOP Assessments[1]

Once first emergency phase, focused on limit population affectation, and water level drop the damaged assessment was handed over within the government from Civil Defense to Risk management and climate change unit within the Housing direction of the Housing and Urban Development Vice Ministry, part of the Ministry of Works(VMVDU-MOP).

Based on the Collective centers assessment figures and on coordination with the municipalities, started the huge work of assess house by house to registry the damages.

Equipment and Human resources are not enough to assess the huge amount of damaged houses. Due Geographical extension and communities dispersion the situation become worst.

Figures available are just a refinement of the collective centers assessment. Much more time will be needed before to be available the final figures.

Tools used by VMVDU-MOP provide useful and detailed information but is delaying the response due not impact figures are available.

[1] Housing and Urban Development Vice-Ministry – Ministry of public Works – (Spanish:Vice Ministerio de Vivienda y Desarrollo Urbano – Ministerio de Obras Públicas)

2.4.Food Assistance Sector Assessment

Food assistance sector has a big network that can assess fast and on systematic way. Within the Flash Appeal revision process has conduct an assessment over 42 municipalities of the most affected. This assessment included damaged houses and destroyed.

This assessment has been enough systematized but the scope is limited, so is not enough by himself to show the impact of the tropical depression at the national level.

3. Needs analysis methodology used.

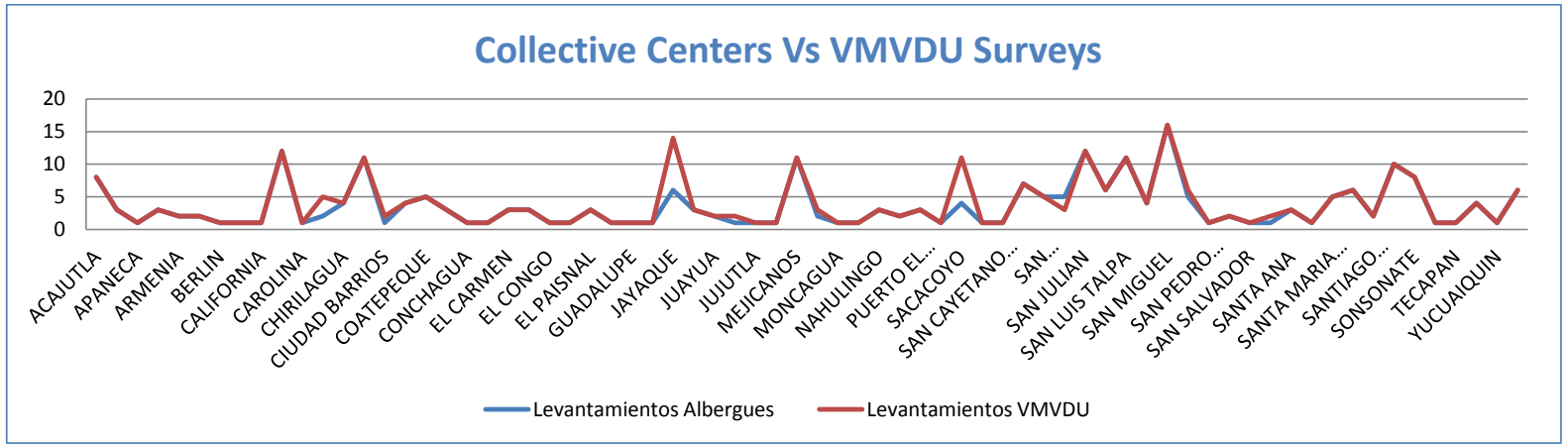
Different assessments available are heterogeneous on methodology, timing and scope, so is not available just compare between them.

The assessments have been comparing between them in order to choose a right strategy.

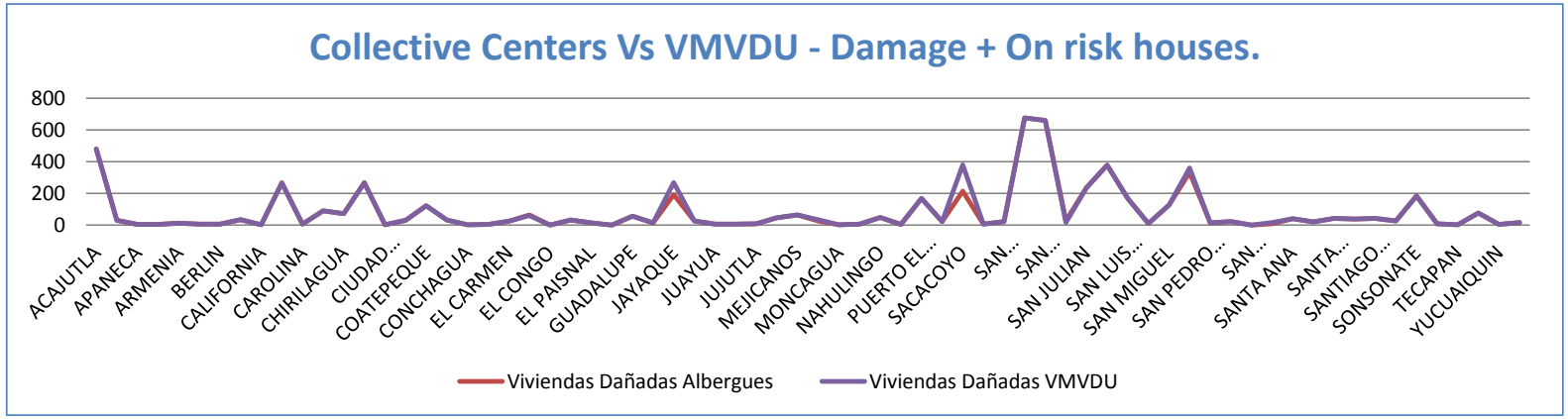
3.1.Comparison: Collective Centers and MVMDU.

First step has been comparing both official assessments. Number of Surveys, Damaged + On Risk houses and destroyed houses has been compare.

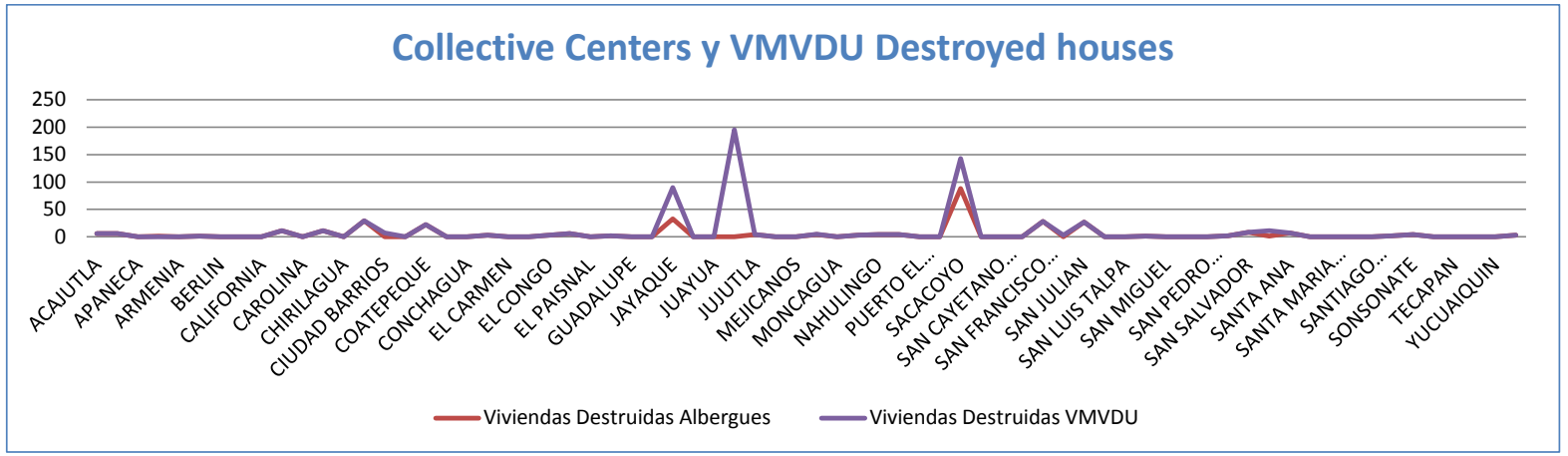
Graphics as follow:



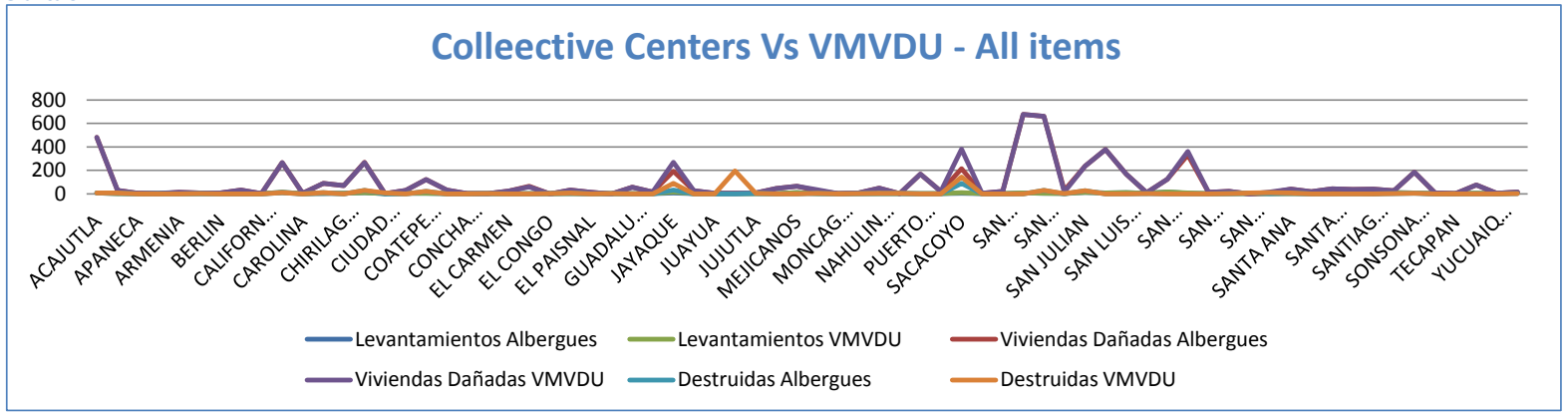
Gráfica 1



Gráfica 2



Gráfica 3



Gráfica 4

Graphics show us that both assessments are highly correlated with almost identical results. VMVDU is a refinement based on the Collective centers assessments.

Collective Centers assessments figures are date on 26th October and VMVDU on 14th November. Based on this comparison, only VMVDU assessment will be considered since they are more recent and (presumably) more accurate and detailed.

3.2.Comparison: Collective Centers and MVMDU.

Once established that VMVDU are the more accurate and recent figures from government, we will compare the 42 municipalities' assets by food assistance and the figures from VMVDU.

Comparison between both show us that Food assistance are higher than VMVDU but correlation between exist unless Zacatecoluca.

(See Graph – Gráfica 5)

Comparing the number of surveys between both assessments, Food assistance is higher than VMVDU. This could be explain because most of the Municipalities assess by VMVDU has been done in the Collective center and food assistance has been done on communities or Caseríos.

(See Graph - Gráfica 6)

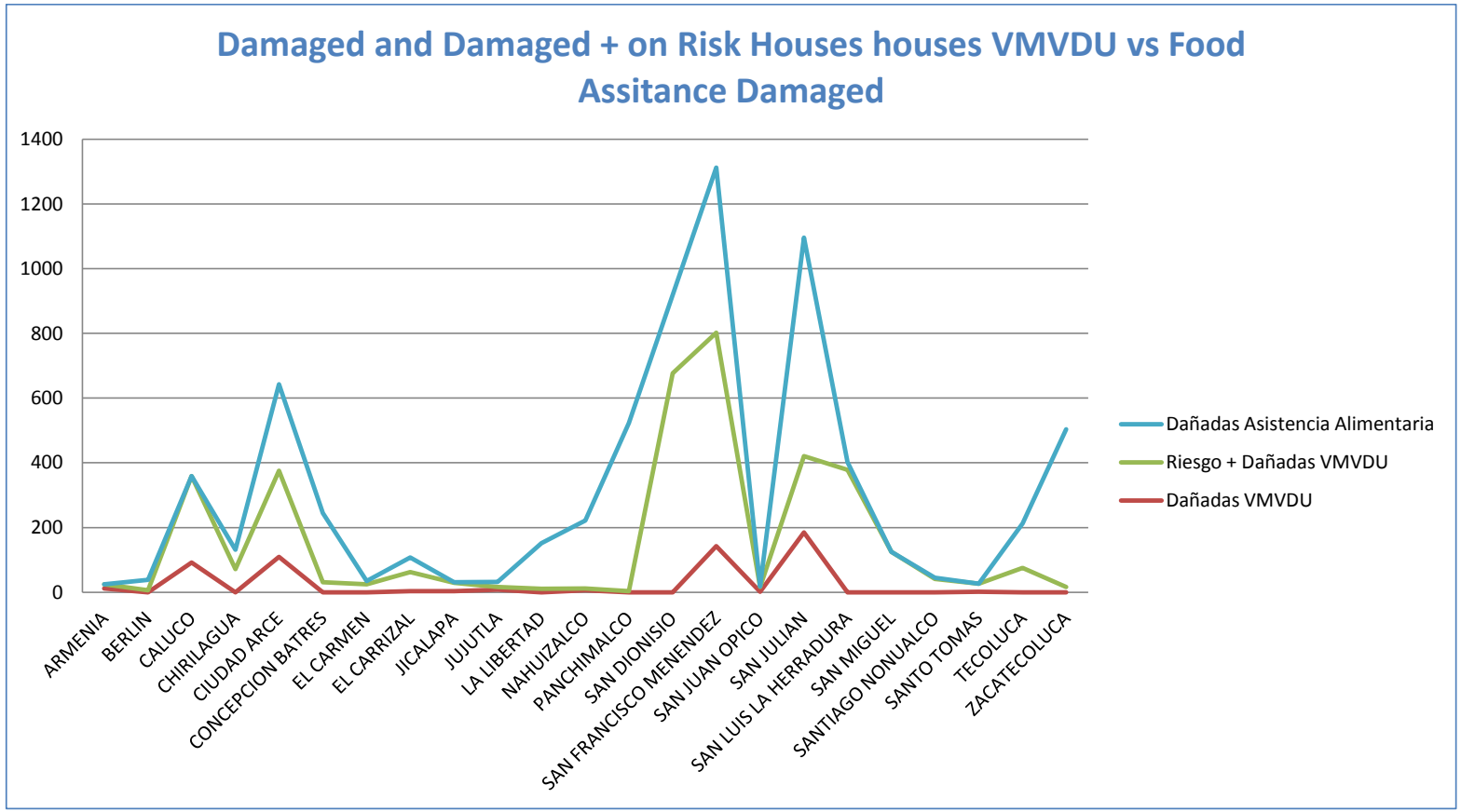
Correlation is higher comparing Damaged + On High risk houses on the VMVDU assessment.

The damaged houses into the Food assistance sector assessment are higher. This could be explained based on that VMVDU got figures from Collective centers assessments. Hosted families, improved refugees and isolated areas during and after the rains are not included.

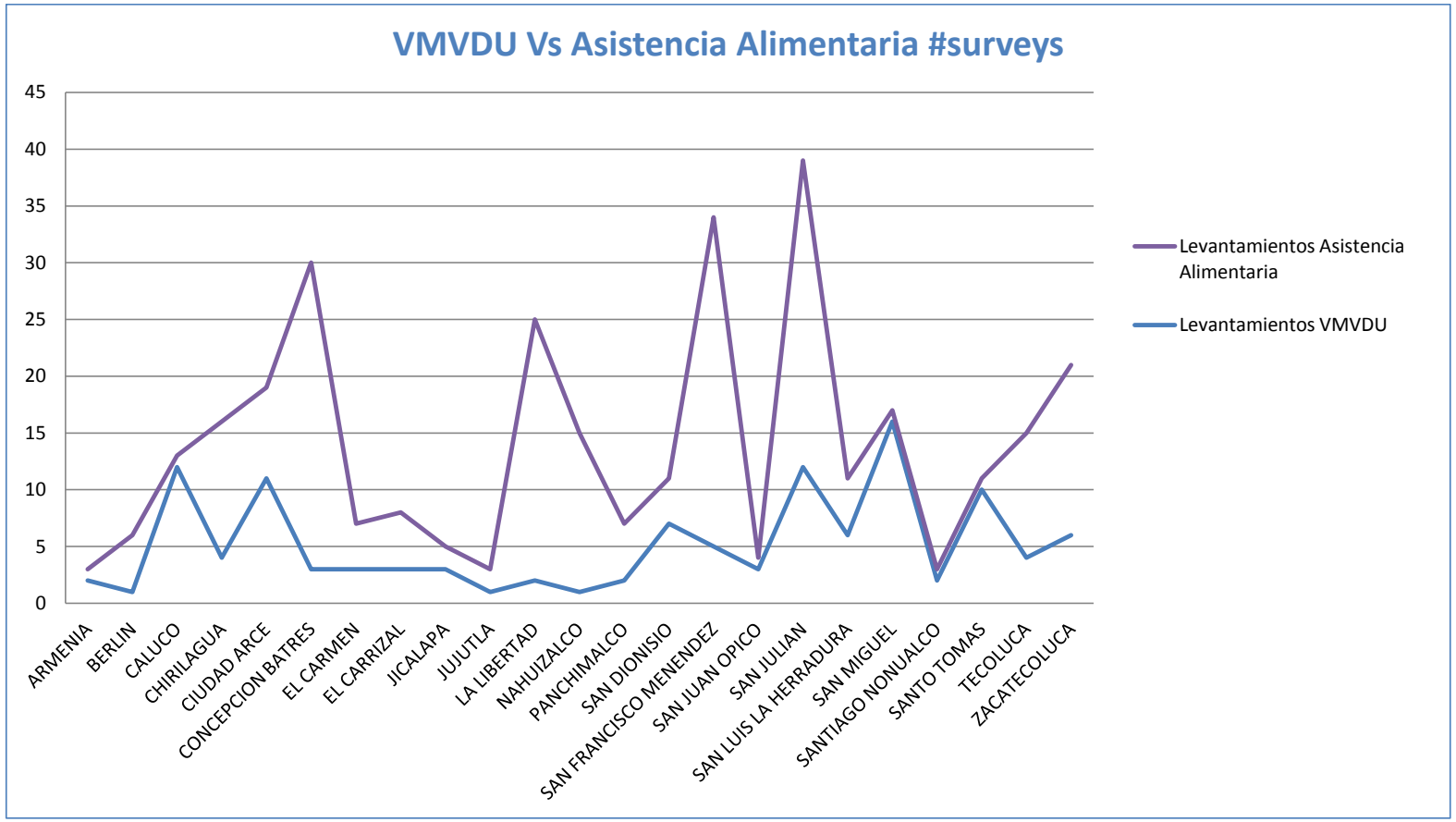
Zacatecoluca case, VMVDU includes 6 surveys and food assistance includes 16, so the figures may be increased due most houses were evaluated.

Jiquilisco has been excluded due into VMVDU assessment. 0 houses were reported damaged and 2049 on high Risk. Several sources checked confirmed that this coastal area is highly exposed to floods and houses have been damaged. Due this value is a distortion element and the assessment criteria has been clearly different has been eliminated in the comparison.

Based on these, Food assistance will be considered as a main reference until the VMVDU assessment has not been finished.


Damaged and Damaged + on Risk Houses houses VMVDU vs Food Assitance Damaged
1400
1200
1000
800
600
400
200
0
ARMENIA
BERLIN
CALUCO
CHIRILAGUA
CIUDAD ARCE
CONCEPCION BATRES
EL CARMEN
EL CARRIZAL
JICALAPA
JUJUTLA
LA LIBERTAD
NAHUIZALCO
PANCHIMALCO
SAN DIONISIO
SAN FRANCISCO MENENDEZ
SAN JUAN OPICO
SAN JULIAN
SAN LUIS LA HERRADURA
SAN MIGUEL
SANTIAGO NONUALCO
SANTO TOMAS
TECOLUCA
ZACATECOLUCA
Dañadas Asistencia Alimentaria
Riesgo + Dañadas VMVDU
Dañadas VMVDU

Gráfica 5


VMVDU Vs Asistencia Alimentaria #surveys
45
40
35
30
25
20
15
10
5
0
ARMENIA
BERLIN
CALUCO
CHIRILAGUA
CIUDAD ARCE
CONCEPCION BATRES
EL CARMEN
EL CARRIZAL
JICALAPA
JUJUTLA
LA LIBERTAD
NAHUIZALCO
PANCHIMALCO
SAN DIONISIO
SAN FRANCISCO MENENDEZ
SAN JUAN OPICO
SAN JULIAN
SAN LUIS LA HERRADURA
SAN MIGUEL
SANTIAGO NONUALCO
SANTO TOMAS
TECOLUCA
ZACATECOLUCA
Levantamientos Asistencia Alimentaria
Levantamientos VMVDU

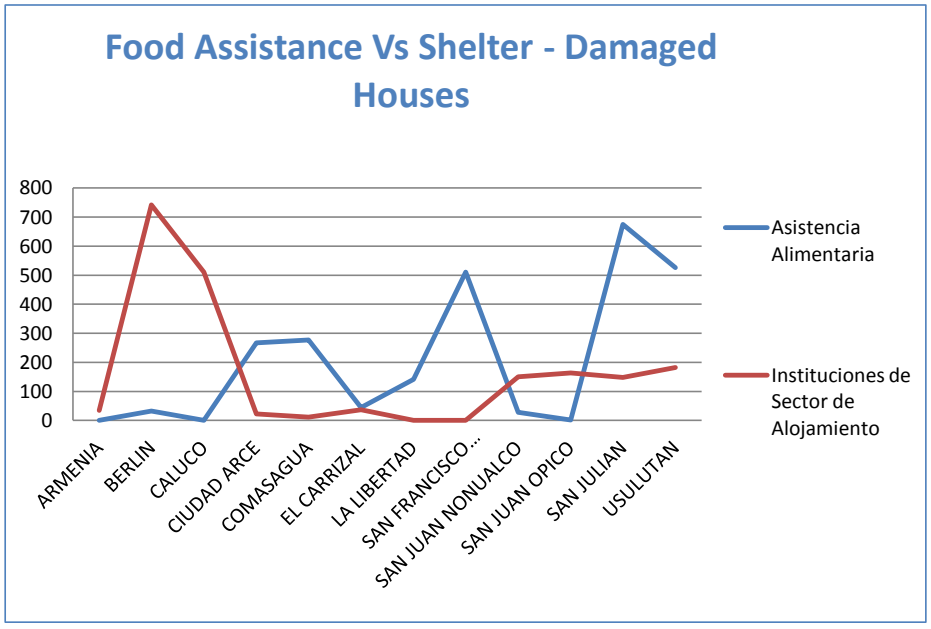
Gráfica 6

3.3.Comparison: Food Assistance and Shelter sectors.

Shelter Sector partners assessments cover only 27% of the affected population. The assessed areas are those where the partners are often working.

Assessments reported by ACPP[2] and his partner *"Comandos de Salavamento de El Salvador"* has been ignored cause was done the days immediately after the rains by rescue teams not trained in shelter assessments. Too high figures were detected when crossed to partial assessments. Our conclusion is that affected houses and damaged houses criteria were mixed. Nevertheless these assessments have been useful to prioritize specialized assessment to some municipalities like Berlín.

The graph shows us that correlation does not exist. Shelter sector partner assess communities but not complete municipalities. Detailed assessments are ongoing in those areas were the figures as are so different.



Gráfica 7

[2] ACPP Asamblea de Cooperación por la Paz.

3.4.Selected Methodology

Base on the situation and until the VMVDU assessments are not finished we have prioritized the assessment based on the confidence of each one.

First priority is Food Assistance assessment, second one is VMVDU and the last one is Shelter partners.

Caluco is an exception due the figures from Shelter partners was complete, so these one has been applied.

4. Analysis Figures

Total Figures[3]:

Tabla 1

	# Surveys	#Destroyed Houses	#Damaged Houses	#Total Houses
Total	**557**	**1,163**	**9,082**	**10,245**

Figures by department:

Tabla 2

Departments	# Surveys	#Destroyed Houses	#Damaged Houses	#Total Houses
AHUACHAPAN	39	75	602	677
CABAÑAS	19	16	117	133
CHALATENANGO	22	12	130	142
CUSCATLAN	11	77	96	173
LA LIBERTAD	124	307	1,850	2,157
LA PAZ	56	69	1,233	1,302
LA UNION	3	0	51	51
MORAZAN	2	6	65	71
SAN MIGUEL	17	8	68	76
SAN SALVADOR	41	64	687	751
SAN VICENTE	21	0	219	219
SANTA ANA	20	61	301	362
SONSONATE	74	227	2,121	2,348
USULUTAN	108	241	1,542	1,783
Total general	**557**	**1,163**	**9,082**	**10,245**

[3] Excel Spreadsheet "Estudio de Necesidades.xlsx": https://www.sheltercluster.org/Americas/ElSalvador/ElSalvadorFloods2011/Pages/Gesti%C3%B3n-de-Informaci%C3%B3n.aspx

Figures by Municipality:

Dataset: Four Sources per Municipality.

Comentario [NB1]: It may be useful to include a table of all municipalities with available data from all sureveys and a highlight of which figure (by location) that youa re choosing to use in your analysis. Then perhaps another summary table of the final (assumed) dataset

Tabla 3

	Destroyed				Damaged			
Municipalities	Collective Centres	VMVDU	Food Assistance	Agencies	Collective Centres	VMVDU	Food Assistance	Agencies
ACAJUTLA	6	6	#N/A	31	481	481	#N/A	64
AHUACHAPAN	6	6	#N/A	#N/A	30	30	#N/A	#N/A
ANTIGUO CUSCATLAN	#N/A[4]	#N/A	0	#N/A	#N/A	#N/A	0	#N/A
APANECA	0	0	#N/A	#N/A	4	4	#N/A	#N/A
APOPA	1	0	#N/A	#N/A	3	4	#N/A	#N/A
ARMENIA	0	0	2	82	12	12	0	35
AYUTUXTEPEQUE	1	1	#N/A	#N/A	6	6	#N/A	#N/A
BERLIN	0	0	0	0	6	6	32	10
CACAOPERA	0	0	#N/A	#N/A	33	33	#N/A	#N/A
CALIFORNIA	0	0	#N/A	#N/A	1	1	#N/A	#N/A
CALUCO	11	11	0	18	267	267	0	511
CAROLINA	0	0	#N/A	#N/A	5	5	#N/A	#N/A
CHALCHUAPA	11	11	#N/A	#N/A	89	89	#N/A	#N/A
CHIRILAGUA	0	0	1	#N/A	71	71	60	#N/A
CIUDAD ARCE	29	29	29	18	268	267	267	22
CIUDAD BARRIOS	0	7	#N/A	#N/A	2	2	#N/A	#N/A

[4] #N/A: No Figures Available.

CIUDAD DELGADO	0	0	#N/A	#N/A	30	30	#N/A	#N/A
COATEPEQUE	22	22	#N/A	#N/A	122	122	#N/A	#N/A
COJUTEPEQUE	#N/A	#N/A	0	#N/A	#N/A	#N/A	18	#N/A
COMASAGUA	#N/A	#N/A	17	3	#N/A	#N/A	277	12
CONCEPCION BATRES	0	0	5	#N/A	31	31	214	#N/A
CONCHAGUA	0	0	#N/A	#N/A	1	1	#N/A	#N/A
CUISNAHUAT	3	3	#N/A	#N/A	3	3	#N/A	#N/A
DOLORES	#N/A	#N/A	4	#N/A	#N/A	#N/A	27	#N/A
EL CARMEN	0	0	1	#N/A	24	24	11	#N/A
EL CARRIZAL	0	0	5	2	64	59	45	37
EL CONGO	3	3	#N/A	#N/A	0	0	#N/A	#N/A
EL DIVISADERO	6	6	#N/A	#N/A	32	32	#N/A	#N/A
EL PAISNAL	0	0	#N/A	#N/A	13	13	#N/A	#N/A
EL PARAISO	#N/A	#N/A	3	#N/A	#N/A	#N/A	68	#N/A
EL PORVENIR	2	2	#N/A	#N/A	0	0	#N/A	#N/A
GUADALUPE	0	0	#N/A	#N/A	55	55	#N/A	#N/A
HUIZUCAR	#N/A	#N/A	4	#N/A	#N/A	#N/A	0	#N/A
ILOBASCO	#N/A	#N/A	4	#N/A	#N/A	#N/A	55	#N/A
ILOPANGO	0	0	#N/A	#N/A	14	14	#N/A	#N/A
JAYAQUE	33	90	#N/A	36	192	268	#N/A	3
JICALAPA	0	0	0	#N/A	26	26	2	#N/A
JIQUILISCO	2	2	10	#N/A	2049	2049	282	#N/A
JUAYUA	0	0	#N/A	#N/A	5	5	#N/A	#N/A
JUCUARAN	0	195	#N/A	#N/A	5	5	#N/A	#N/A
JUJUTLA	4	4	5	#N/A	8	8	16	#N/A
LA LIBERTAD	#N/A	0	3	1	#N/A	11	141	0
LA UNION	0	0	#N/A	#N/A	46	46	#N/A	#N/A

MEJICANOS	0	0	#N/A	#N/A	64	64	#N/A	#N/A
METAPAN	4	5	#N/A	60	26	34	#N/A	29
MONCAGUA	0	0	#N/A	#N/A	1	1	#N/A	#N/A
NAHUIZALCO	3	3	1	#N/A	6	6	210	#N/A
NAHULINGO	4	4	#N/A	#N/A	47	47	#N/A	#N/A
OLOCUILTA	#N/A	#N/A	#N/A	18	#N/A	#N/A	#N/A	107
OZATLAN	#N/A	#N/A	2	#N/A	#N/A	#N/A	51	#N/A
PANCHIMALCO	4	4	43	#N/A	3	3	520	#N/A
PUERTO EL TRIUNFO	0	0	#N/A	#N/A	168	168	#N/A	#N/A
QUEZALTEPEQUE	#N/A	#N/A	0	#N/A	#N/A	#N/A	34	#N/A
ROSARIO DE MORA	0	0	#N/A	#N/A	22	22	#N/A	#N/A
SACACOYO	88	143	#N/A	99	214	381	#N/A	13
SALCOATITAN	0	0	#N/A	#N/A	5	5	#N/A	#N/A
SAN BARTOLOME PERULAPIA	#N/A	#N/A	#N/A	66	#N/A	#N/A	#N/A	0
SAN CAYETANO ISTEPEQUE	0	0	#N/A	#N/A	22	22	#N/A	#N/A
SAN DIONISIO	0	0	0	78	677	677	242	182
SAN FERNANDO	#N/A	#N/A	0	#N/A	#N/A	#N/A	1	#N/A
SAN FRANCISCO MENENDEZ	28	28	57	9	660	660	511	0
SAN JOSE VILLANUEVA	#N/A	#N/A	#N/A	0	#N/A	#N/A	#N/A	10
SAN JUAN NONUALCO	#N/A	#N/A	0	50	#N/A	#N/A	28	150
SAN JUAN OPICO	0	3	3	0	28	15	2	163
SAN JULIAN	27	27	189	31	236	236	675	148
SAN LORENZO	#N/A	#N/A	#N/A	5	#N/A	#N/A	#N/A	12
SAN LUIS LA HERRADURA	0	0	8	#N/A	378	378	24	#N/A
SAN LUIS TALPA	0	0	#N/A	#N/A	167	167	#N/A	#N/A

SAN MARTIN	1	1	#N/A	#N/A	9	9	#N/A	#N/A
SAN MIGUEL	0	0	0	#N/A	125	125	0	#N/A
SAN PEDRO MASAHUAT	0	0	#N/A	2	332	360	#N/A	17
SAN PEDRO NONUALCO	0	0	#N/A	#N/A	13	13	#N/A	#N/A
SAN PEDRO PUXTLA	2	2	#N/A	#N/A	21	21	#N/A	#N/A
SAN SALVADOR	8	8	#N/A	#N/A	0	0	#N/A	#N/A
SAN SEBASTIAN SALITRILLO	1	11	#N/A	#N/A	8	16	#N/A	#N/A
SAN VICENTE	#N/A	#N/A	0	#N/A	#N/A	#N/A	5	#N/A
SANTA ANA	7	7	#N/A	#N/A	40	40	#N/A	#N/A
SANTA ELENA	0	0	#N/A	#N/A	19	19	#N/A	#N/A
SANTA MARIA OSTUMA	0	0	#N/A	1	42	42	#N/A	1
SANTA TECLA	0	0	#N/A	#N/A	37	37	#N/A	#N/A
SANTIAGO NONUALCO	0	0	0	#N/A	41	41	4	#N/A
SANTIAGO TEXACUANGOS	#N/A	#N/A	1	#N/A	#N/A	#N/A	5	#N/A
SANTO TOMAS	2	2	10	#N/A	25	25	0	#N/A
SENSUNTEPEQUE	#N/A	#N/A	8	#N/A	#N/A	#N/A	35	#N/A
SONSONATE	4	4	#N/A	9	184	184	#N/A	0
SUCHITOTO	#N/A	#N/A	#N/A	10	#N/A	#N/A	#N/A	67
TACUBA	0	0	#N/A	#N/A	8	8	#N/A	#N/A
TALNIQUE	#N/A	#N/A	#N/A	2	#N/A	#N/A	#N/A	64
TAMANIQUE	#N/A	#N/A	0	#N/A	#N/A	#N/A	186	#N/A
TECAPAN	0	0	#N/A	#N/A	2	2	#N/A	#N/A
TECOLUCA	0	0	0	#N/A	75	75	137	#N/A
TEJUTLA	#N/A	#N/A	4	#N/A	#N/A	#N/A	16	#N/A
TEOTEPEQUE	#N/A	#N/A	0	#N/A	#N/A	#N/A	97	#N/A
TEPECOYO	#N/A	#N/A	#N/A	16	#N/A	#N/A	#N/A	84
USULUTAN	#N/A	#N/A	29	#N/A	#N/A	#N/A	526	#N/A

YUCUAIQUIN	0	0	#N/A	#N/A	4	4	#N/A	#N/A
ZACATECOLUCA	3	3	43	#N/A	16	16	488	#N/A

IASC Inter-Agency Standing Committee
EL SALVADOR SHELTER CLUSTER

Tropical Depression E12 - 2011

Tabla 4

Food Assistance	
VMVDU	
Shelter Partners	

Final Dataset

Municipalities	# Surveys	# Destroyed Houses	# Damaged Houses	Total Houses
ARMENIA	1	2	0	2
BERLIN	5	0	32	32
CALUCO	9	18	511	529
CHIRILAGUA	12	1	60	61
CIUDAD ARCE	8	29	267	296
COJUTEPEQUE	1	0	18	18
COMASAGUA	13	17	277	294
CONCEPCION BATRES	27	5	214	219
DOLORES	6	4	27	31
EL CARMEN	4	1	11	12
EL CARRIZAL	5	5	45	50
EL PARAISO	11	3	68	71
HUIZUCAR	1	4	0	4
ILOBASCO	6	4	55	59
JICALAPA	2	0	2	2
JIQUILISCO	35	10	282	292
JUJUTLA	2	5	16	21
LA LIBERTAD	23	3	141	144
NAHUIZALCO	14	1	210	211
OZATLAN	8	2	51	53
PANCHIMALCO	5	43	520	563
QUEZALTEPEQUE	3	0	34	34
SAN DIONISIO	4	0	242	242
SAN FERNANDO	4	0	1	1
SAN FRANCISCO MENENDEZ	29	57	511	568
SAN JUAN NONUALCO	1	0	28	28
SAN JUAN OPICO	1	3	2	5
SAN JULIAN	27	189	675	864
SAN LUIS LA HERRADURA	5	8	24	32
SAN MIGUEL	1	0	0	0
SAN VICENTE	8	0	5	5
SANTIAGO NONUALCO	1	0	4	4
SANTIAGO TEXACUANGOS	5	1	5	6
SANTO TOMAS	1	10	0	10
SENSUNTEPEQUE	7	8	35	43

TAMANIQUE	5	0	186	186
TECOLUCA	11	0	137	137
TEJUTLA	2	4	16	20
TEOTEPEQUE	3	0	97	97
USULUTAN	21	29	526	555
ZACATECOLUCA	15	43	488	531
ACAJUTLA	8	6	481	487
AHUACHAPAN	3	6	30	36
APANECA	1	0	4	4
APOPA	3	0	4	4
AYUTUXTEPEQUE	2	1	6	7
CACAOPERA	1	0	33	33
CALIFORNIA	1	0	1	1
CAROLINA	1	0	5	5
CHALCHUAPA	5	11	89	100
CIUDAD BARRIOS	2	7	2	9
CIUDAD DELGADO	4	0	30	30
COATEPEQUE	5	22	122	144
CONCHAGUA	1	0	1	1
CUISNAHUAT	1	3	3	6
EL CONGO	1	3	0	3
EL DIVISADERO	1	6	32	38
EL PAISNAL	3	0	13	13
EL PORVENIR	1	2	0	2
GUADALUPE	1	0	55	55
ILOPANGO	1	0	14	14
JAYAQUE	14	90	268	358
JUAYUA	2	0	5	5
JUCUARAN	2	195	5	200
LA UNION	1	0	46	46
MEJICANOS	11	0	64	64
METAPAN	3	5	34	39
MONCAGUA	1	0	1	1
NAHULINGO	3	4	47	51
PUERTO EL TRIUNFO	3	0	168	168
ROSARIO DE MORA	1	0	22	22
SACACOYO	11	143	381	524
SALCOATITAN	1	0	5	5
SAN CAYETANO ISTEPEQUE	1	0	22	22
SAN LUIS TALPA	11	0	167	167
SAN MARTIN	4	1	9	10
SAN PEDRO MASAHUAT	6	0	360	360
SAN PEDRO NONUALCO	1	0	13	13
SAN PEDRO PUXTLA	2	2	21	23

SAN SALVADOR	1	8	0	8
SAN SEBASTIAN SALITRILLO	2	11	16	27
SANTA ANA	3	7	40	47
SANTA ELENA	1	0	19	19
SANTA MARIA OSTUMA	5	0	42	42
SANTA TECLA	6	0	37	37
SONSONATE	8	4	184	188
TACUBA	1	0	8	8
TECAPAN	1	0	2	2
YUCUAIQUIN	1	0	4	4
OLOCUILTA	11	18	107	125
SAN BARTOLOME PERULAPIA	1	66	0	66
SAN JOSE VILLANUEVA	3	0	10	10
SAN LORENZO	1	5	12	17
SUCHITOTO	5	10	67	77
TALNIQUE	9	2	64	66
TEPECOYO	22	16	84	100
Totals	**557**	**1163**	**9082**	**10245**

Finally, just remark that these are temporary figures, due there are municipalities included in the most 47 affected by Civil Defense where information is not available. Assessment has been program[5].

Tabla 5

Most affected municipalities not assessed	Code
CHILTIUPAN	0505
CONCEPCION DE ORIENTE	1403
EL TRANSITO	1207
ESTANZUELAS	1107
LISLIQUE	1409
PASAQUINA	1412
POLOROS	1413
SAN ALEJO	1414
SAN JOSE	1415
SANTA ISABEL ISHUATAN	0305

[5] Maps available: https://www.sheltercluster.org/Americas/ElSalvador/ElSalvadorFloods2011/Pages/Gesti%c3%b3n-de-Informaci%c3%b3n.aspx

5. Maps

5.1.Households Damaged

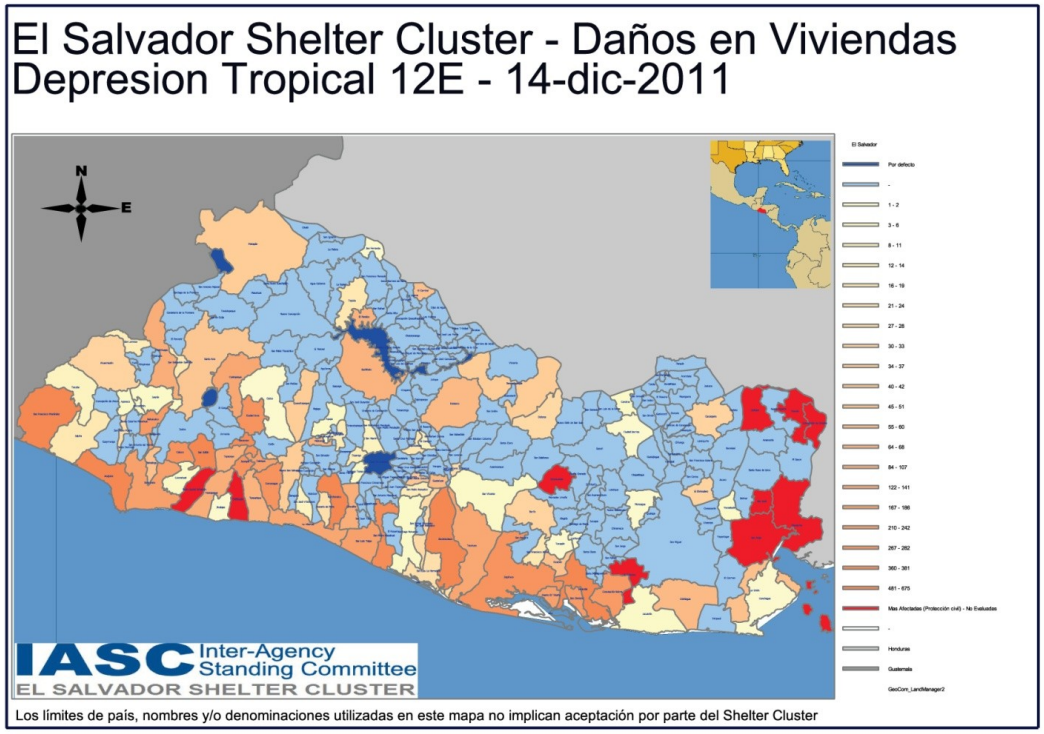


Ilustración 1

5.2.Destroyed Households

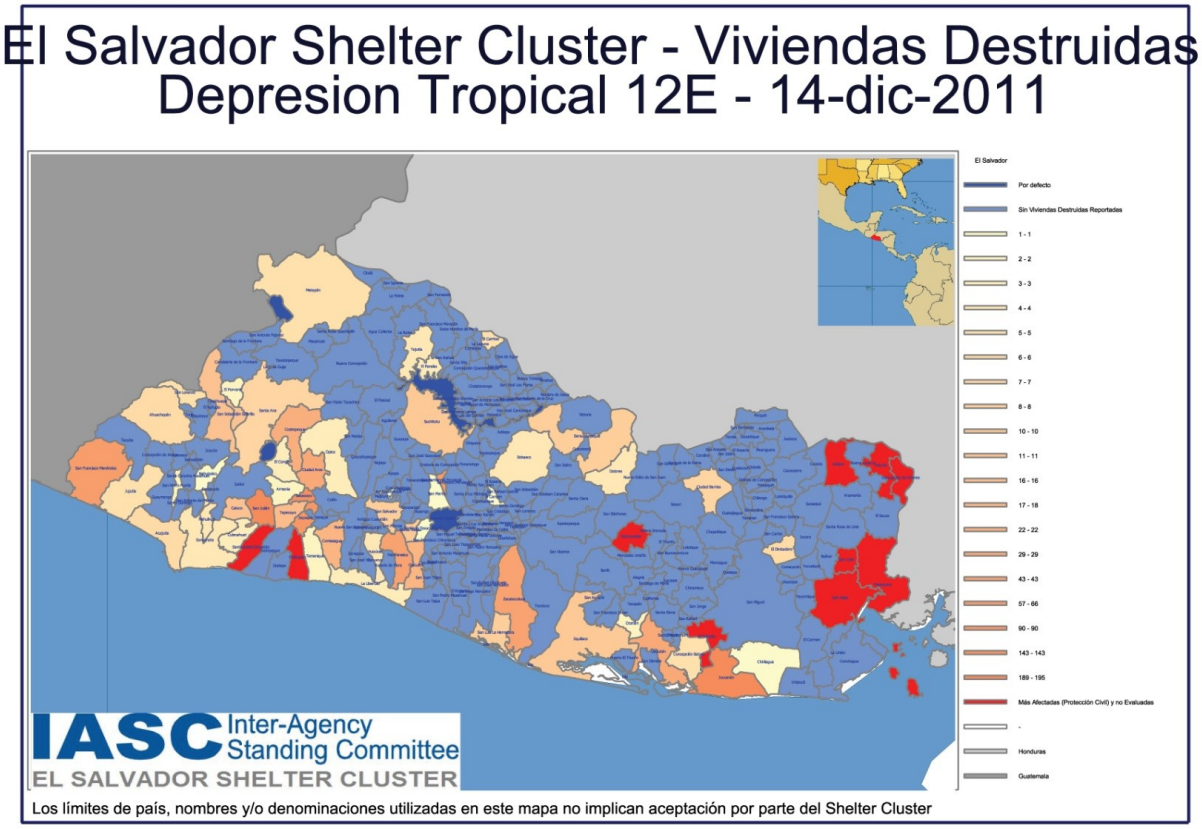


Ilustración 2