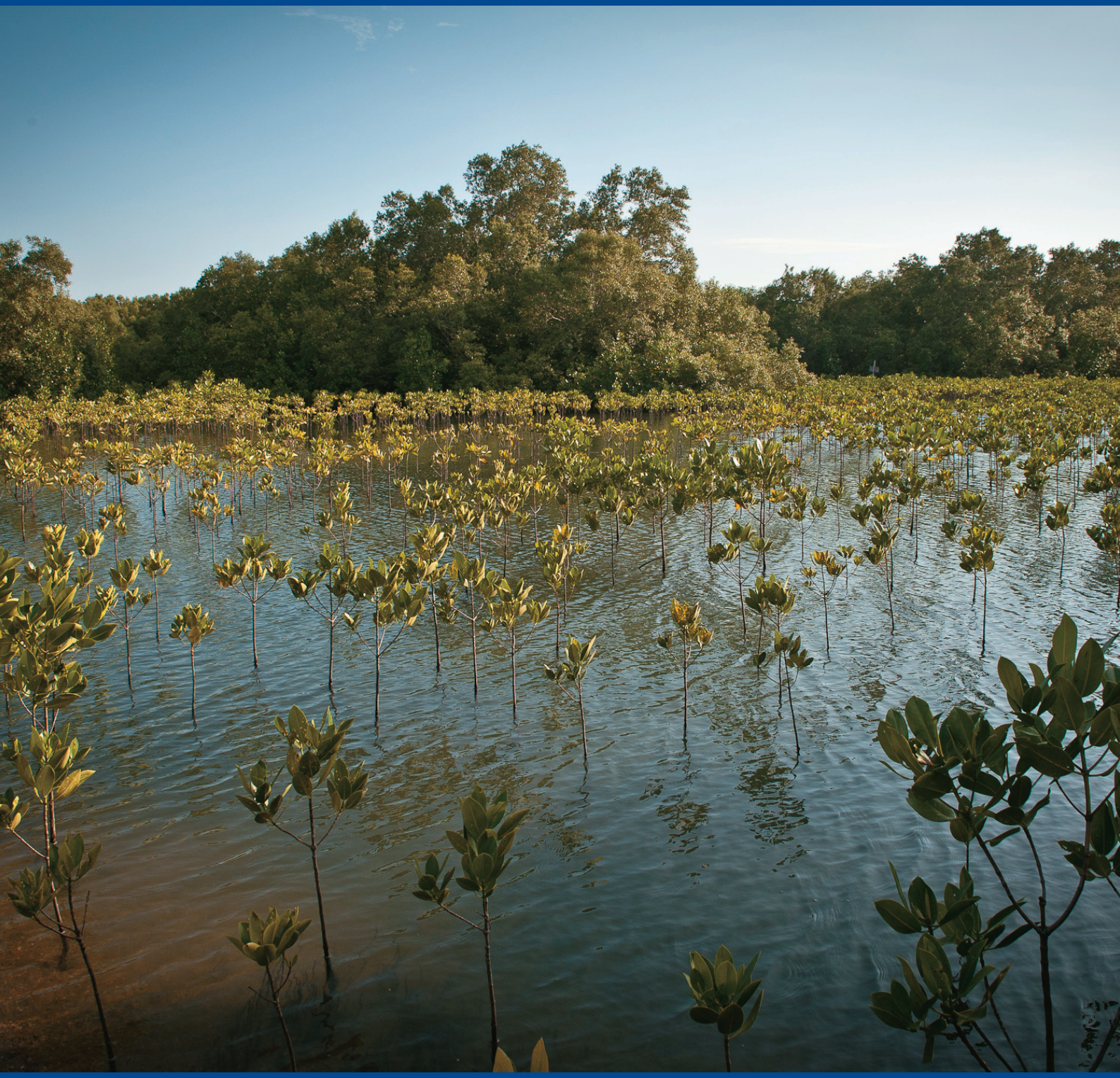
CORAL TRIANGLE INITIATIVE
ON CORAL REEFS, FISHERIES AND FOOD SECURITY
PHILIPPINES

VERDE ISLAND PASSAGE MANGROVE GROUND TRUTHING AND VALIDATION



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Cover photo: This mangrove forest is part of a Marine Protected Area in Balibago, Verde Islands Passage, Phillipines. The twelve families that tend it have started a seedling nursery. Photo: © CTSP / Tory Read

Verde Island Passage Mangrove Ground Truthing and Validation

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Report on the VIP Mangrove Ground Truthing and Validation

Introduction

CI under the Coral Triangle Support Partnership (CTSP) Program and funded by the USAID is implementing various projects in support of the goals of the Coral Triangle Initiative. In 2010, CI Philippines supported local communities, particularly in Calatagan, Batangas, by piloting mangrove cover enhancements, including nursery establishment, and rehabilitation/tree planting activities, as a climate-change adaptation response. Calatagan, Batangas is part of a bigger area CI is supporting, which is the Verde Island Passage (VIP) Corridor.

Possible replication and/or scaling up of the mangrove rehabilitation and enhancement activities and climate change adaptation planning within the corridor would need baseline data identifying the extent of mangrove cover, including those that are now converted into other uses such as fishponds. To come up with the baseline, CI acquired sets of satellite images for remote sensing (RS) interpretation and mapping. Field survey for ground truthing and data validation was needed to assess interpretation results and add accuracy to the RS interpretation. The map output is expected to be utilized by LGUs and land use managers in prioritizing their investments in climate-change adaptation response in terms of mangrove management and other related activities.

Prior to actual fieldwork, CI presented the activity to concerned Provincial LGU partners and their MPA network council composed of Municipal representatives. In Batangas the activity was presented on December 10, 2010 during the Batangas MPA Network meeting, in Oriental Mindoro on January20, 2011, and in Lubang-Looc, Occidental Mindoro on January 25, 2011. Field schedule for Lubang-Looc was reiterated in March 25 meeting between CI and the LGU.

The ground truthing and validation survey commenced on March 15, 2011 and targeted areas in Calapan, Oriental Mindoro where CI was joined and assisted by the Provincial Agriculture Office (PAGO). On the first to second week of April, 2011, CI validation team, together with the personnel of Batangas Provincial Government Environment and Natural Resources Office (PG-ENRO) - Planning Department, validated the areas within the province of Batangas and assisted by representatives of each Municipal Environment and Natural Resources Office with jurisdiction on the location of the identified observation points/areas. Finally, the fieldwork in the municipalities of Lubang and Looc was carried out in the first week of April, 2011 in which the Office of the Municipal Planning and Development Coordinator, and personnel from Municipal Agriculture Office assisted in the conduct of the survey.

Objective

The survey activity was done to check on the existence of fishponds and mangrove stands on the coastline fringe of selected municipalities in the Verde Island Passage and to assess the accuracy of the satellite imagery interpretation.

Materials and methods

One hundred eleven (111) points were pre-determined by the Remote Sensing Analyst for ground truthing . The set of points covered areas in Batangas City, municipalities of Lemery, Calatagan, Lian and Nasugbu in the province of Batangas, Calapan, Naujan and Pola in Oriental Mindoro, and in Lubang and Looc in Occidental Mindoro.

We used a combination of GPS handheld units to locate the target point for validation and collect GPS readings. Garmin 76Cs and Garmin E-trex Vista were used to navigate to and locate the pre-determined points. Additional GPS readings were recorded when possible where we used either of the GPS units and a Magellan Promark3 GPS. The Magellan Promark 3 had sub-meter accuracy when used with a base station, while Garmin 76Cs and Garmin E-trex Vista were observed to have average accuracies of 3-5meters and 7-9 meters, respectively. Tracks of areas that were reached during the validation were also recorded using the Garmin GPS units. Working maps with the location of target points for filed observation, as guide for the GPS, were also prepared and printed using the unclassified satellite ALOS image as base map.

For transport and transfer from one location to another, the Provincial LGU in Mindoro Oriental provided a vehicleand used for areas within the province. For field work in Batangas province, a CI vehicle was used. In Lubang and Looc, on the other hand, the LGUs provided service vehicles. However, the target points and areas with GPS readings were only reachable on foot or small boat was hired when necessary.

Results and Discussions

The following tables were the results of the ground truthing and validation activities carried out from March 26 – May 6, 2011.

Table 1. Target points (TP) for the field survey

TP	*Municipal*	*Province*	*Latitude*	*Longitude*	*Cover*	*Notes*
1	Lubang	Occidental Mindoro	13.843537	120.094426	> not reached	most likely part of fishpond; reading at about 160m distance
2	Lubang	Occidental Mindoro	13.838184	120.099337	along fishpond dike	operational fispond; dike in east-west direction; river with Avicennia about 15m east
3	Lubang	Occidental Mindoro	13.836036	120.099323	> observed landcover coconut	GPS reading corner dike of fishpond other side of river along edge; @ reading with Avicennia at 3-4m south.
4	Lubang	Occidental Mindoro	13.809908	120.204288	mangrove, mix sp.	GPS reading at North and SE of area
5	Lubang	Occidental Mindoro	13.809840	120.208375	> not reached but mangrove	observed from landward as mangrove. most likely dominated by Rhizophora
6	Lubang	Occidental Mindoro	13.808740	120.205960	operational fishpond	GPS reading from fishpond dike corner of mangrove area
7	Lubang	Occidental Mindoro	13.809146	120.209574	operational fishpond	GPS reading from north along 1m dike; mangrove at east-northeast of dike
8	Lubang	Occidental Mindoro	13.823262	120.211990	point at sea	GPS track between mangrove area and point
9	Lubang	Occidental Mindoro	13.823073	120.214062	point at sea	GPS track aboard banca around the point; patch of few sonneratia noted within encircled path
10	Looc	Occidental Mindoro	13.792968	120.234616	> not reached but mangrove	private area fenced from the road; most likely stand of Avicennia with creek or river
11	Looc	Occidental Mindoro	13.789504	120.250852	non-operating fishpond area	GPS reading within but near edge of fishpond
12	Looc	Occidental Mindoro	13.820491	120.320424	> not reached but mangrove	GPS track aboard banca near edge of mangrove area; mainly Rhizopora stylosa
13	Looc	Occidental Mindoro	13.820551	120.322025	point at sea	sailed by boat in between mangrove area and point
14	Looc	Occidental	13.730404	120.250090	fishpond	GPS reading along dike north-NE of point

TP	*Municipal*	*Province*	*Latitude*	*Longitude*	*Cover*	*Notes*
		Mindoro				
15	Looc	Occidental Mindoro	13.728632	120.249953	point along +/- 5m wide fishpond dike	operational fishpond; GPS reading along dike; fishpond corner near edge of creek
16	Looc	Occidental Mindoro	13.728411	120.248617	sparse mangrove regeneration	GPS reading at west near edge of abandoned fp; mangrove regeneration mostly Avicennia
17	Looc	Occidental Mindoro	13.733037	120.251477	ricefield	uncultivated during validation; GPS reading near point
18	Looc	Occidental Mindoro	13.731808	120.247081	edge ricefield, swamp	swamp with sparse vege between point and road; ricefield west-north-NE; GPS reading near point
19	Nasugbu	Batangas	14.087022	120.624974	fishpond	
20	Nasugbu	Batangas	14.089334	120.628594	saltbed/pond adjacent to pond	
21	Nasugbu	Batangas	14.096636	120.629758	> not reached; Nypa	fenced area
22	Nasugbu	Batangas	14.094419	120.628542	fishpond	
23	Nasugbu	Batangas	14.092845	120.627611	fishpond	
24	Nasugbu	Batangas	14.091897	120.628823	fishpond	observed from 90m
25	Nasugbu	Batangas	14.092234	120.634139	fishpond	
26	Nasugbu	Batangas	14.090970	120.632221	fishpond adjacent to creek	
27	Nasugbu	Batangas	14.088877	120.636433	> not reached	
28	Nasugbu	Batangas	14.085814	120.635991	> not reached	
29	Nasugbu	Batangas	13.967335	120.618373	fishpond	
30	Lian	Batangas	13.968842	120.620448	> not reached; mangrove	observed from about 100m SE as mix of Avicennia and Sonneratia
31	Lian	Batangas	13.964163	120.621244	fishpond	observed along fishpond dike about 45m east
32	Lian	Batangas	13.966844	120.619694	fishpond	non-operating; observed from fishpond dike N-NE of point
33	Calatagan	Batangas	13.818593	120.659157	not reached <fishpond>	Private fenced
34	Calatagan	Batangas	13.816069	120.659922	not reached <fishpond>	Private fenced
35	Calatagan	Batangas	13.817196	120.661175	not reached <fishpond>	Private fenced
36	Calatagan	Batangas	13.814774	120.663172	not reached <fishpond>	Private fenced

TP	Municipal	Province	Latitude	Longitude	Cover	Notes
37	Calatagan	Batangas	13.809463	120.665445	not reached <built up area>	observed as community of concrete houses
38	Calatagan	Batangas	13.821162	120.659933	not reached <fishpond>	
39	Calatagan	Batangas	13.926043	120.621982	non-operating fishpond	GPS reading near point along dike
40	Calatagan	Batangas	13.923774	120.622218	along creek/waterway w/Avicennia	GPS reading along dike edge of waterway
41	Calatagan	Batangas	13.923106	120.620006	mangrove	refo mainly Rhizopora, tress mainly Rhizophora and Avicennia mangrove refo noted from fishpond dike to point
42	Calatagan	Batangas	13.921282	120.621070	> not reached but mangrove	mix sp.
43	Calatagan	Batangas	13.917828	120.621746	fishpond	near corner, abandoned or maybe non-operating but with water; GPS reading about 30m WSW
44	Lemery	Batangas	13.893846	120.902187	mix mangrove, coconut, herbs	GPS reading near point
45	Lemery	Batangas	13.891573	120.902505	River area	
46	Lemery	Batangas	13.896251	120.903182	non-operating fishpond	GPS reading along dike
47	Lemery	Batangas	13.890428	120.907224	non-operating fishpond	GPS reading along edge of fishpond dike
48	Lemery	Batangas	13.894343	120.903620	grass mainly Typha	edge non-operating fishpond filled with Typha grass
49	Lemery	Batangas	13.894752	120.900494	> not reached; grass bunkhouse	GPS reading near point along dike with grass cogon and typha
50	Batangas City	Batangas	13.767505	121.040319	> not reached; grass	Tall grass talahib and Typha
51	Batangas City	Batangas	13.769277	121.032973	> not accessible to public	most likely mangrove <Google earth>
52	Batangas City	Batangas	13.768855	121.036037	> not accessible to public	most likely mangrove <Google earth>
53	Batangas City	Batangas	13.771032	121.037549	> not accessible to public	most likely mangrove <Google earth>
54	Batangas City	Batangas	13.762367	121.045431	not accessible to public	within PPA area
55	Batangas City	Batangas	13.767966	121.033761	built up - heliport	<Google earth>
56	Batangas City	Batangas	13.760369	121.046772	open being filled up by soil	near road area observed with cogon grass
57	Batangas City	Batangas	13.757683	121.048759	> not reached; fishpond	GPS readings on west and southern portion fispond dikes/edges
58	Batangas City	Batangas	13.754542	121.046638	> not observable	behind warehouses
59	Batangas City	Batangas	13.753581	121.046555	built up area	GPS reading near edge of fishpond

TP	*Municipal*	*Province*	*Latitude*	*Longitude*	*Cover*	*Notes*
60	Batangas City	Batangas	13.760894	121.042589	> not accessible to public	within PPA area
61	Batangas City	Batangas	13.749623	121.048506	hyacinth covered swamp/river	remnants of mangroves observed; observation from bridge
62	Batangas City	Batangas	13.750864	121.047308	swamp with lilies	GPS reading near point; open to bare with short grasses
63	Calapan City	Oriental Mindoro	13.387038	121.146321	point along fishpond dike	fishpond area
64	Calapan City	Oriental Mindoro	13.383838	121.151878	fishpond	observed from about 90m distance; dikes damaged
65	Calapan City	Oriental Mindoro	13.386981	121.151192	fishpond	observed from about 80m distance; dikes damaged
66	Calapan City	Oriental Mindoro	13.386050	121.144154	fishpond	
67	Calapan City	Oriental Mindoro	13.381031	121.147786	fishpond	
68	Calapan City	Oriental Mindoro	13.394696	121.149005	fishpond	
69	Calapan City	Oriental Mindoro	13.397723	121.151347	fishpond	
70	Calapan City	Oriental Mindoro	13.398596	121.156778	fishpond	
71	Calapan City	Oriental Mindoro	13.369313	121.147024	Nypa area	
72	Calapan City	Oriental Mindoro	13.365399	121.130979	agri area - with trees	adjacent to Nypa; Nypa towards lake area
73	Calapan City	Oriental Mindoro	13.402680	121.145540	grass cogon area	Nypa on the surroundings
74	Calapan City	Oriental Mindoro	13.410097	121.146901	mangrove	Avicennia; vegetation along coast
75	Calapan City	Oriental Mindoro	13.409517	121.149885	mangrove	mix species, Avicennia, Rhizophora; refo with R. apiculata
76	Calapan City	Oriental Mindoro	13.402067	121.150415	fishpond	adjacent mangrove dominated by Avicennia
77	Calapan City	Oriental Mindoro	13.398766	121.148407	fishpond	
78	Calapan City	Oriental Mindoro	13.401575	121.140063	fishpond	dikes with banana; under construction
79	Calapan City	Oriental Mindoro	13.398404	121.136919	fishpond	
80	Calapan City	Oriental Mindoro	13.401464	121.137605	agri area - banana and coconut	grass undergrowth; adjacent fishpond - abandoned
81	Calapan City	Oriental Mindoro	13.362803	121.267585	fishpond	damaged
82	Calapan City	Oriental Mindoro	13.365992	121.262387	mangrove	mix species, Sonneratia, Lumnitsera,; Beach, sandy
83	Calapan City	Oriental Mindoro	13.363734	121.263851	mangrove	mix species, Nypa, Avicennia, Lumnitsera
84	Calapan City	Oriental Mindoro	13.364318	121.256029	fishpond	

TP	*Municipal*	*Province*	*Latitude*	*Longitude*	*Cover*	*Notes*
85	Calapan City	Oriental Mindoro	13.363674	121.260304	mangrove	mix species, Nypa, Avicennia, Sonneratia, Excoecaria, Lumnitsera
86	Calapan City	Oriental Mindoro	13.371652	121.245626	mangrove	mix species, Sonneratia, Avicennia, Ceriops; sparse tree density
87	Calapan City	Oriental Mindoro	13.366484	121.251526	mangrove	mix species, Nypa, Sonneratia, Avicennia
88	Calapan City	Oriental Mindoro	13.367841	121.253036	> not reached; coconut	<Google earth> mix of coconut and other vege
89	Calapan City	Oriental Mindoro	13.366320	121.248379	fishpond	under construction
90	Calapan City	Oriental Mindoro	13.349406	121.277235	Nypa area	mix with Ceriops
91	Calapan City	Oriental Mindoro	13.349713	121.274341	mangrove	mix sp., Rhizophora, near creek
92	Calapan City	Oriental Mindoro	13.349882	121.283182	fishpond	some Excoecaria, point near fishpond waterway
93	Calapan City	Oriental Mindoro	13.343822	121.297072	mangrove	mix sp., Rhizophora, Ceriops, Avicennia, Sonneratia
94	Calapan City	Oriental Mindoro	13.345458	121.297339	agri area - coconut	sparse coconut with cogon, Mimosa (Aroma) thickets along mangrove edge
95	Calapan City	Oriental Mindoro	13.344388	121.300294	fishpond	abandoned; sparse regeneration of Sonneratia and Avicennia
96	Naujan	Oriental Mindoro	13.339786	121.296044	> not reached	
97	Calapan City	Oriental Mindoro	13.342394	121.279064	agri area - citrus, coconut	area near ricefields
98	Calapan City	Oriental Mindoro	13.351165	121.287733	open grassland	
99	Calapan City	Oriental Mindoro	13.347567	121.287091	fishpond	
100	Pola	Oriental Mindoro	13.138708	121.441816	mangrove	mix sp., Rhizophora and Sonneratia
101	Pola	Oriental Mindoro	13.139310	121.443350	mangrove	mix sp., Rhizophora, Sonneratia, Avicennia
102	Pola	Oriental Mindoro	13.137948	121.444570	fishpond	
103	Pola	Oriental Mindoro	13.136266	121.438244	fishpond	
104	Pola	Oriental Mindoro	13.125341	121.436496	fishpond	
105	Pola	Oriental Mindoro	13.127500	121.438625	mangrove	mix sp., Sonneratia, Rhizophora, Avicennia, Excoecaria
106	Pola	Oriental Mindoro	13.125041	121.439805	mangrove	mix sp., Avicennia, Nypa
107	Pola	Oriental Mindoro	13.128394	121.442999	fishpond with vege	Hibiscus, Excoecaria, Avicennia

TP	Municipal	Province	Latitude	Longitude	Cover	Notes
108	Pola	Oriental Mindoro	13.131318	121.443167	fishpond	
109	Pola	Oriental Mindoro	13.122814	121.441497	fishpond	
110	Pola	Oriental Mindoro	13.129234	121.445883	fishpond with vege	Hibiscus, Excoecaria, Avicennia
111	Pola	Oriental Mindoro	13.130504	121.444477	mangrove	mix sp., Rhizophora, Bruguiera, Xylocarpus; river bank

Table 2. GPS Readings including additional observation points

ID	TP	Longitude	Latitude	Notes	GPS Used
1	-	121.28219444	13.34861111	Avicennia, with enrichment planting of Rhizophora	Garmin 76
2	-	121.27955556	13.34802778	Coconut	Garmin 76
3	90	121.27783333	13.34888889	Ceriops	Garmin 76
4	96	121.29677778	13.33986111	mix sp., Ceriops, Nypa	Garmin 76
5	91	121.27425000	13.34894444	mix sp., Avicennia, Nypa	Garmin 76
6	106	121.43925000	13.12508333	mix sp., Nypa, Rhizophora, Bruguiera	Garmin 76
7	7	120.20955373	13.80936106	Fishpond dike; mangrove facing north; fishpond south	Magellan Promark3
8	6	120.20540441	13.80906723	Fishpond dike; mangrove to northeast	Magellan Promark3
9	4	120.20399105	13.80973400	Edge mangrove; ricefield at south	Magellan Promark3
10	4	120.20439707	13.81017394	Edge mangrove area to south	Magellan Promark3
11	-	120.20339824	13.80771155	Edge ricefield and open swamp near mangrove	Magellan Promark3
12	-	120.09304510	13.84357254	Edge swamp	Magellan Promark3
13	-	120.09324846	13.84234273	Corner fishpond	Magellan Promark3
14	-	120.09347947	13.84214201	Along dike; fishpond NE mangrove mainly Nypa at South	Magellan Promark3
15	-	120.09376562	13.84208995	Along dike; fishpond NE mangrove mainly Nypa at South	Magellan Promark3
16	-	120.09927861	13.83657129	Fishpond corner dike, Avicennia along river	Magellan Promark3
17	2	120.09947626	13.83821013	Fishpond dike, near river with Avicennia	Magellan Promark3
18	17	120.25153917	13.73306652	Ricefield current off crop	Magellan Promark3

ID	*TP*	*Longitude*	*Latitude*	*Notes*	*GPS Used*
19	14	120.25029468	13.73075561	Dike of fishpond; target pt 14 is fishpond area	Magellan Promark3
20	18	120.24706946	13.73178878	Edge ricefield and small swamp area	Magellan Promark3
21	16	120.24806498	13.72830323	Sparse mangrove mainly Avicennia, abandoned fishpond	Magellan Promark3
22	-	120.24784352	13.72814626	Non-operation salt bed	Magellan Promark3
23	-	120.24855867	13.72633968	along trail, parallel on edge of salt bed	Magellan Promark3
24	15	120.25020167	13.72873010	Near edge river; 5m dike corner	Magellan Promark3
25	-	120.24950158	13.72840844	Corner fishpond	Magellan Promark3
26	-	120.25131891	13.71938790	Corner 1m sea wall	Magellan Promark3
27	-	120.25113000	13.71992729	Corner 1m sea wall	Magellan Promark3
28	-	121.24895074	13.36509574	Dike of fishpond; Nypa on edge towards river	Magellan Promark3
29	87	121.25154140	13.36647484	Mix of Nypa and mangroves	Magellan Promark3
30	-	121.25114704	13.36850536	Small isle of grass and shrubs	Magellan Promark3
31	-	121.25114980	13.36820111	Isle of grass shrubs and mangroves	Magellan Promark3
32	-	121.25128962	13.36784849	Grass and shrubs	Magellan Promark3
33	-	121.24605964	13.37132269	Mangroves mostly Sonneratia	Magellan Promark3
34	-	121.25126070	13.36735068	Sparse mangroves Sonneratia mix	Magellan Promark3
35	86	121.24581350	13.37162644	Mangrove transition Sonneratia to Avicennia	Magellan Promark3
36	-	121.24869219	13.36804013	Corner fishpond near house	Magellan Promark3
37	-	121.24885084	13.36724729	Corner fishpond	Magellan Promark3
38	-	121.04961751	13.75649968	edge fishpond	Garmin Etrex Vista Cx
39	-	121.03965302	13.76553839	tall grass (Typha)	Garmin Etrex Vista Cx
40	-	121.03927634	13.76616561	along dike trail	Garmin Etrex Vista Cx
41	40	120.62225176	13.92384086	edge of fishpond and waterway	Garmin Etrex Vista Cx
42	-	121.03813506	13.76650005	corner of fishpond	Garmin Etrex Vista Cx
43	44	120.90229550	13.89393691	mix of mangrove including coconut	Garmin Etrex Vista Cx
44	49	120.90042408	13.89453613	fishpond dike; pt 49 observed near a bunkhouse of fishpond	Garmin Etrex Vista Cx
45	-	120.90339848	13.89595251	fishpond dike	Garmin Etrex Vista Cx
46	45	120.90130443	13.89021040	along river near isle of mangrove and other herbs	Garmin Etrex Vista Cx

ID	*TP*	*Longitude*	*Latitude*	*Notes*	*GPS Used*
47	-	120.90165697	13.88982953	along river near isleof mangrove and other herbs	Garmin Etrex Vista Cx
48	-	120.61685407	13.96748786	dike corner adj to mangrove	Garmin Etrex Vista Cx
49	-	120.61714894	13.96754645	fishpond corner along dike adj to mangrove	Garmin Etrex Vista Cx
50	-	120.61951666	13.96769615	corner of fishpond dike near creek	Garmin Etrex Vista Cx
51	-	120.61991254	13.96472041	corner of fishpond dike near creek with Avicennia	Garmin Etrex Vista Cx
52	-	120.62185287	13.96484513	corner of fishpond dike near creek with Avicennia	Garmin Etrex Vista Cx
53	-	120.62083346	13.92363508	corner 5 m dike	Garmin Etrex Vista Cx
54	-	120.62049081	13.92290326	corner 1m dike open E:fp W: Open water ad	Garmin Etrex Vista Cx
55	-	120.62162555	13.92321163	corner 3m dike	Garmin Etrex Vista Cx
56	-	120.62126261	13.92289018	mangrove mostly Avicennia	Garmin Etrex Vista Cx
57	-	120.62117075	13.92271467	edge mangrove (Avicennia) and open water West-SW	Garmin Etrex Vista Cx
58	-	120.62202335	13.92650312	non operating fishpond	Garmin Etrex Vista Cx
59	39	120.62200466	13.92610582	dike non-operating fishpond	Garmin Etrex Vista Cx
60	-	120.62277496	13.91844878	1m dike fishpond	Garmin Etrex Vista Cx
61	43	120.62151088	13.91768443	fence of resort, edge of mangrove mostly Avicennia	Garmin Etrex Vista Cx
62	-	120.61835837	13.87972631	fence of E: resort with pool, S: mangrove	Garmin Etrex Vista Cx
63	-	120.66185717	13.81167700	top of hill, open rocky	Garmin Etrex Vista Cx
64	-	120.65900372	13.81276882	edge of fishpond and waterway with Avicennia	Garmin Etrex Vista Cx
65	89	121.24835000	13.36626216	fishpond not yet operational	Garmin Etrex Vista Cx
66	-	121.24599972	13.37108066	sparse Sonneratia	Garmin Etrex Vista Cx
67	-	120.61820240	13.96416031	corner fispond and crop area	Magellan Promark3
68	-	120.61966660	13.96319062	corner fispond and ricefield	Magellan Promark3
69	-	120.62075190	13.96311976	corner fishpond and ricefield at South	Magellan Promark3
70	-	120.62147560	13.96302624	corner fishpond and ricefield	Magellan Promark3
71	31	120.62149840	13.96416956	corner fishpond	Magellan Promark3
72	-	120.62151940	13.96483057	corner fishpond	Magellan Promark3
73	-	120.62094250	13.96467667	corner fishpond	Magellan Promark3
74	-	120.62055530	13.96455034	corner fishpond	Magellan Promark3

ID	*TP*	*Longitude*	*Latitude*	*Notes*	*GPS Used*
75	-	120.62074050	13.96598476	corner fishpond near a house; mangroves Avicennia	Magellan Promark3
76	32	120.61954570	13.96759496	corner fishpond	Magellan Promark3
77	29	120.61836120	13.96780452	middle of creek	Magellan Promark3
78	-	120.61432050	13.96698914	corner fishpond adj mangrove	Magellan Promark3
79	-	120.61528110	13.96671955	corner fishpond adj mangrove	Magellan Promark3
80	-	120.61473380	13.96616880	along road; mahogany stand at South, Fisphond at North	Magellan Promark3
81	-	120.62087890	13.96687681	creek with Avicennia	Magellan Promark3
82	-	120.62072460	13.96723631	corner of fishpond dike adj. creek	Magellan Promark3
83	-	120.62090150	13.96781359	open sparse mangrove	Magellan Promark3
84	-	120.62179020	13.96749689	Grass	Magellan Promark3
85	-	120.62286840	13.96758274	area with few houses, Mimosa (aroma) surroundings	Magellan Promark3
86	-	120.62464110	13.96804639	dike corner	Magellan Promark3
87	-	120.90351490	13.88912098	edge fishpond	Magellan Promark3
88	-	120.90329620	13.89048373	edge river	Magellan Promark3
89	-	120.90484640	13.89119159	Coconut	Magellan Promark3
90	-	120.90310420	13.89346222	Coconut	Magellan Promark3
91	44	120.90241770	13.89394165	mix mangrove some coconut and herbs	Magellan Promark3
92	-	120.90749950	13.89064611	edge river	Magellan Promark3
93	47	120.90734440	13.89048381	edge fishpond; fishpond at West, grass East, grass at North, fishpond South	Magellan Promark3
94	59	121.04674120	13.75330920	fishpond	Magellan Promark3
95	-	121.04753070	13.75771933	trail dike	Magellan Promark3
96	-	121.04954020	13.75661863	along trail	Magellan Promark3
97	-	120.25179092	13.78733704	edge of fishpond; dry, not operating	Garmin Etrex Vista Cx
98	-	120.25195110	13.78768908	fishpond; dry, not operating	Garmin Etrex Vista Cx
99	-	120.32131227	13.82098594	point at sea, mangrove area observed almost single sp.; R. stylosa	Garmin Etrex Vista Cx
100	-	120.32199305	13.81998958	point at sea, near edge of mangrove R. stylosa	Garmin Etrex Vista Cx

Various accessibility issues were faced by the team during the actual field work. These included: inaccessible fishponds due to damaged dikes and high tide; high level of mud within fishpond or riverbank; impassable river/creek; and secured and restricted areas, and private areas. Most of the inaccessbile points were, therefore, observed from a distance. Some points, however, were right within the fishpond or the middle of a thick mangrove. In those cases, the survey team attempted to get to the target as near as possible by penetrating through the mangrove stand or going through the fishpond dike area nearest to the point. Out of the 111 identified points 99 of these were verified. These included 16 points that were not reached, but were clearly observable from where the survey team was only able to access. Among areas not readily accessible were the Sta. Rita power plant of the First Gas Power Corporation and the compound of the Philippine Ports Authority. Some of the points that were not verified, however, can be referred to, alternatively, using the Google Earth map, which had some high resolution image to show, but, unfortunately, were still not that clear.

Verified mangrove areas were noted of the mix of species, particularly, those dominant or widely present in the area. Among these species include, *Avicennia marina, Sonneratia alba, Nypa fruticans, Rhizophora apiculata, Rhizhophora mucronata, Rhizophora stylosa, Ceriops* and *Excoecaria*. Some grass areas associated with mangrove were covered with tall *Typha angustifolia*.

The validation team also recorded some of the GPS tracks, which, particularly, noted possible shift of one of the image covering Batangas area when the GPS waypoint records and tracks were overlaid. The additional GPS point readings were collected whenever possible while navigating to target ground truthing/validation points to record other areas with mangrove vegetation, fishpond area and associated land cover.

Summary

About 90 percent of target areas were verified due to limitations in accessibility. The pre-identified target areas were validated to be comprised of various land cover types. Among these land cover types included operating and non-operating fishponds, mixed species mangrove areas, mangrove area dominated by single species (e.g. Avicennia and Nypa), points along the sea, agricultural area including coconut, grassy area, river, built-up area and other ponds or swamps.

Select Photo Documentations

Mindoro Oriental


Target Pt #64


Target Pt #65


Target Pt #72


Target Pt #74


Target Pt #75


Target Pt #81


Target Pt #94


Target Pt#101


Target Pt #100


Target Pt #102

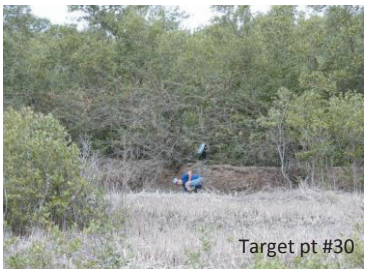

Target Pt #109


Target Pt #76

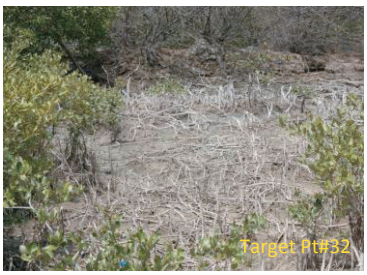
Batangas


Target pt #23


Target pt #24


Target pt #30


Target Pt #31


Target Pt#32


Target Pt. #44


Target Pt #47


Target Pt #48


Target Pt #58


Target Pt #59


Target Pt #61

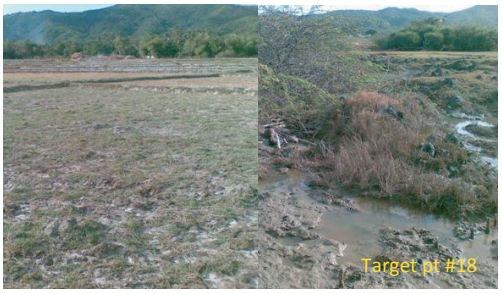

Near Target Pt #62


Target Pts #41

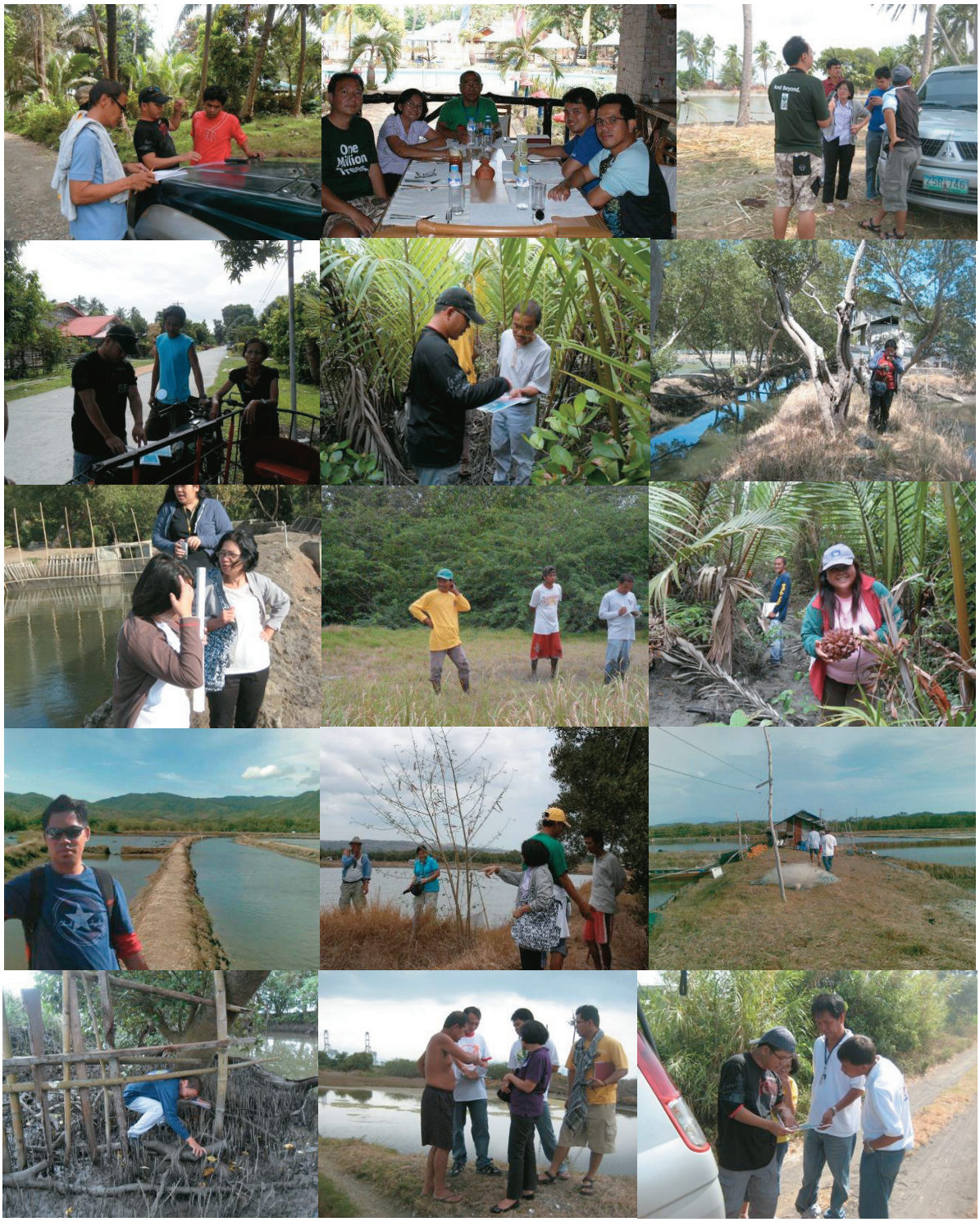

Target Pts #33-36

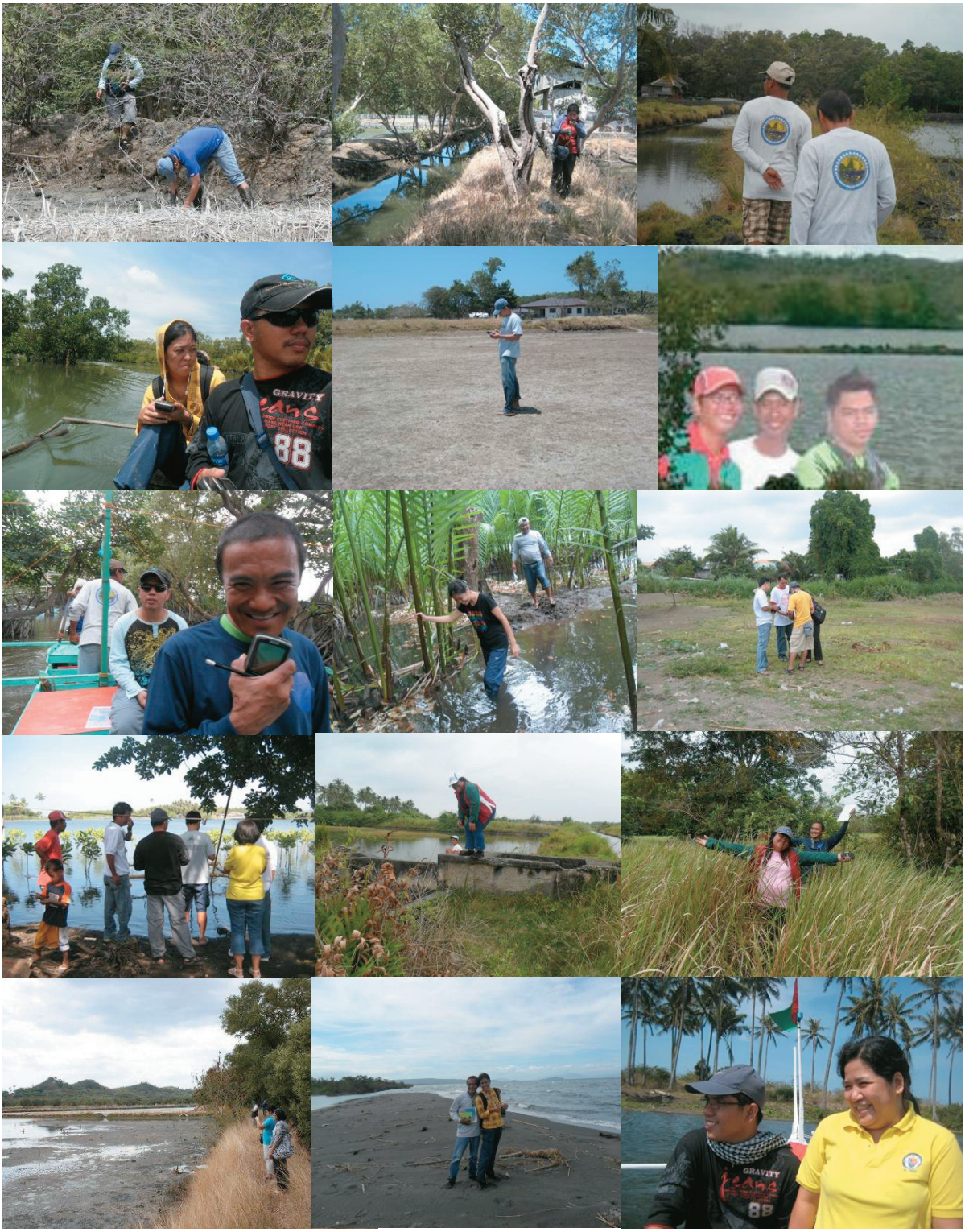

Target Pt #39

Lubang-Looc



Ground Truthing / Validation Teams




GRAVITY
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