

Does gender matter?

The case of sandfish (*Holothuria scabra*) sea ranching
in Pandaraonan, Guimaras, Philippines

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What is sandfish (*Holothuria scabra*)?

Family: **Holothuriidae**

Commercial name: “**trepang**”,
“**beche-de-mer**”

Description: **grey/black with dark transverse wrinkles. Dorsal area is grey or white**

Habitat & ecology: **Intertidal area; sea grass beds, fringing reefs**

Status: **Endangered** (IUCN; ver. 3.1, 2013)

Threat: **Commercial harvest**

Sources: **Jaeger, 1833; Hamel, et al., 2013**



Concepcion, Iloilo, Philippines © C Recente, SEAFDEC/AQD



Source: IUCN, 2006

Sandfish population

Wholesale prices of trepang in Puerto Princesa City from 1998 to 2002

Species	Size: Number of specimens/kg (mean dried weight of specimen)	Price (USD/kg)				
		1998	1999	2000	2001	2002
<i>H. scabra</i>	XL: 15 (67 g)	29.7	35.0	36.7	37.3	40.4
	L: 20 (50 g)	22.8	27.5	31.1	29.4	36.5
	M: 40 (25 g)	16.0	18.8	24.4	21.6	23.1
	S: 60 (17 g)	9.1	11.3	16.7	13.7	15.4
	XS: 80 (13 g)	6.9	8.8	12.2	12.7	13.5
<i>H. tuscogilva</i>	XL: 3-4 (250-333 g)	21.7	30.0	35.6	35.3	35.6
	L: 5-6 (167-200 g)	20.5	27.5	34.4	33.3	34.6
	M: 7-8 (125-143 g)	17.1	22.5	26.7	21.6	24.0
	S: 8-10 (100-125 g)	12.6	15.0	17.8	15.7	16.3
	XS: 11-15 (67-91 g)	9.1	12.5	12.4	9.8	10.6
<i>S. horrens</i>	L: >7.9 cm	12.6	20.0	21.1	21.6	28.8
<i>S. herrmanni</i>	M: 6.4-7.6 cm	9.1	12.5	14.4	15.7	20.2
	S: 5.1-6.4 cm	6.9	10.0	11.6	11.8	14.4
	XS: <5.1 cm	4.1	6.3	6.7	5.9	6.7
<i>Actinopyga</i> spp.	L: >7.6 cm	14.8	20.0	24.4	21.6	25.4
	M: 6.4 cm	10.3	13.8	15.6	15.7	19.6
	S: 2.5-6.4 cm	8.0	11.3	11.6	11.8	12.5
	XS: <2.5 cm	5.7	10.0	6.7	7.8	9.6
<i>H. whitmaei</i>	L: 5-6 (167-200 g)	14.8	17.5	26.7	19.6	23.1
	M: 7-8 (125-143 g)	12.6	15.0	22.2	17.6	19.2
	S: 8-10 (100-125 g)	10.3	11.3	17.8	13.7	15.4
	XS: 11-15 (67-91 g)	9.1	8.8	11.1	9.8	9.6
<i>A. mauritiana</i>	L: >7.6 cm	8.2	11.3	14.4	12.7	13.5
	M: 6.4-7.6 cm	5.0	7.5	11.1	8.8	8.7
	S: 3.8-6.4 cm	3.7	6.3	8.0	5.5	5.4
	XS: 2.5-3.8 cm	2.3	3.0	4.0	2.4	2.3
<i>A. echinites</i>		9.6	11.3	15.6	12.7	13.5
<i>B. argus</i>		5.3	7.0	8.4	8.2	8.3
<i>Bohadschia</i> spp.	L: >10.2 cm	3.7	5.5	6.9	5.9	6.0
	M: 6.4 cm	2.7	5.0	6.2	5.3	5.4
	S: <6.4 cm	1.8	3.0	4.0	3.3	3.3
<i>H. edulis</i>	L: >12.7 cm	2.3	3.3	5.3	4.7	4.6
	S: 5.1-12.7 cm	-	-	4.9	3.9	4.1
<i>H. atra</i>	L: >12.7 cm	2.5	4.0	5.3	3.9	4.2
	M: 10.2-12.7 cm	1.6	2.1	3.1	2.4	2.7
	S: 5.1-10.2 cm	0.7	1.0	2.2	1.6	1.5
<i>H. leucospilota</i>	-	1.8	3.3	4.9	3.9	4.0
<i>T. anax</i>	-	3.4	4.3	4.9	3.7	4.0
<i>H. fuscopunctata</i>	-	1.8	2.8	2.9	2.7	2.9
<i>B. graeffei</i>	-	1.4	2.1	2.4	1.8	2.1

Source: Akamine, 2005

Market demand



High price



Lacking or weakly implemented policies



Population decline

Sandfish sea ranching project



Marine Science Institute
University of the Philippines
(UP-MSI)



Australian Government

**Australian Centre for
International Agricultural Research**



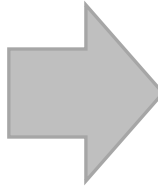
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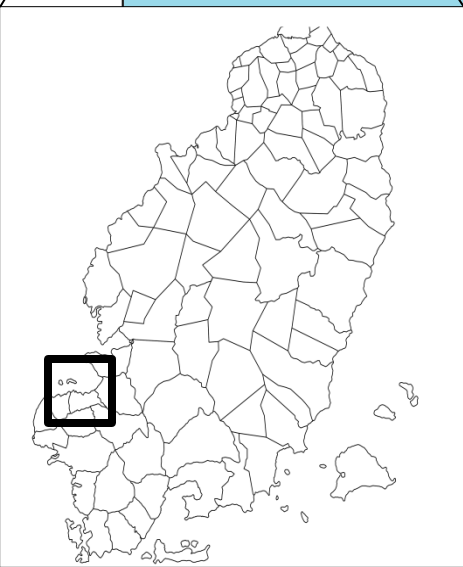
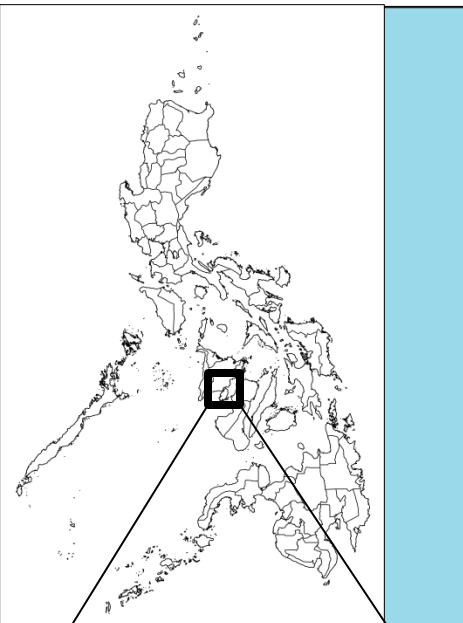


Institute of Fisheries R&D
Mindanao State University
(MSU-Naawan)



122°29.400'E

122°31.200'E



10°31.200'N

10°30.000'N

Igang

Pandaraonan

Dolores

SCALE 1:20000

500 0 500 1000 m

OBJECTIVES

1. Identify the areas utilized by men and women
2. Determine gender differences in socio-demographic characteristics and perceptions on socio-political conditions in the community
3. Determine factors that influence the respondents' willingness to participate in the sandfish sea ranching project

METHODOLOGY



March 2015 - February 2016



Survey

April 2016

RESOURCE UTILIZATION

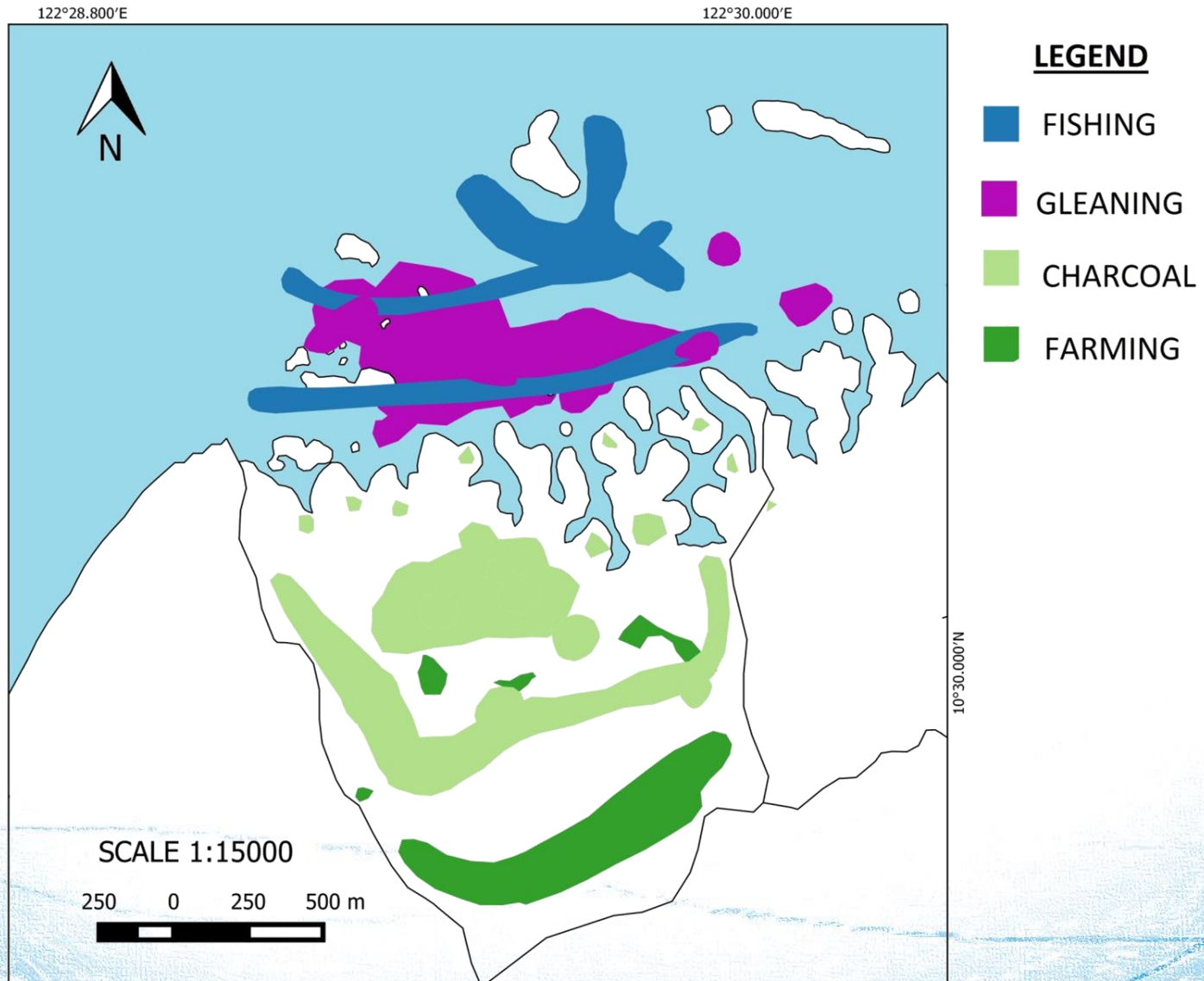


Legend:

- Red – Gleaning
- Blue – Fishing
- Green – Charcoal source/s
- Orange – Farming area/s



RESOURCE UTILIZATION



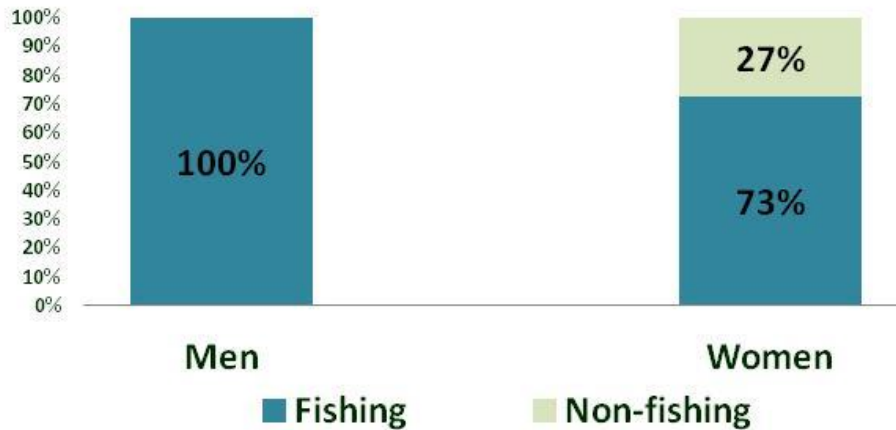
DEMOGRAPHIC PROFILE

Variable	Men	Women	All
	% Mean \pm SD (n=30)	% Mean \pm SD (n=30)	% Mean \pm SD (n=60)
Age	50 \pm 13	48 \pm 13	49 \pm 13
Years of education	8 \pm 3	7 \pm 3	7 \pm 3
Occupation diversity	1.7 \pm 0.5	1.7 \pm 0.8	1.7 \pm 0.6
Occupation multiplicity	1.8 \pm 0.4	1.8 \pm 0.8	1.8 \pm 0.6
Years spent in fishing	33 \pm 14	26 \pm 17	30 \pm 16
Fishing hours (hours)*	5 \pm 3	3 \pm 2	4 \pm 3
Organizational membership*	90%	57%	73%
Membership duration*	5.3 \pm 8	1.1 \pm 2	3.2 \pm 6

Note: *Significant at 0.05 level

DEMOGRAPHIC PROFILE

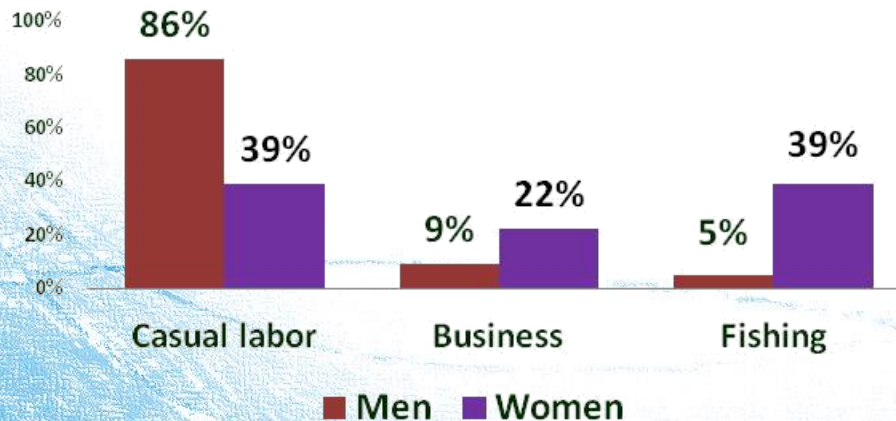
Primary income source/s



*Monthly income



Secondary income sources



Monthly income:
Men = PhP5332 (USD 115.20)
Women = PhP3392 (USD 73.29)

Note: *Significant at 0.05 level
 USD 1 = Philippine *Peso* 46.29, the exchange rate in April 2016

AWARENESS AND PERCEPTIONS

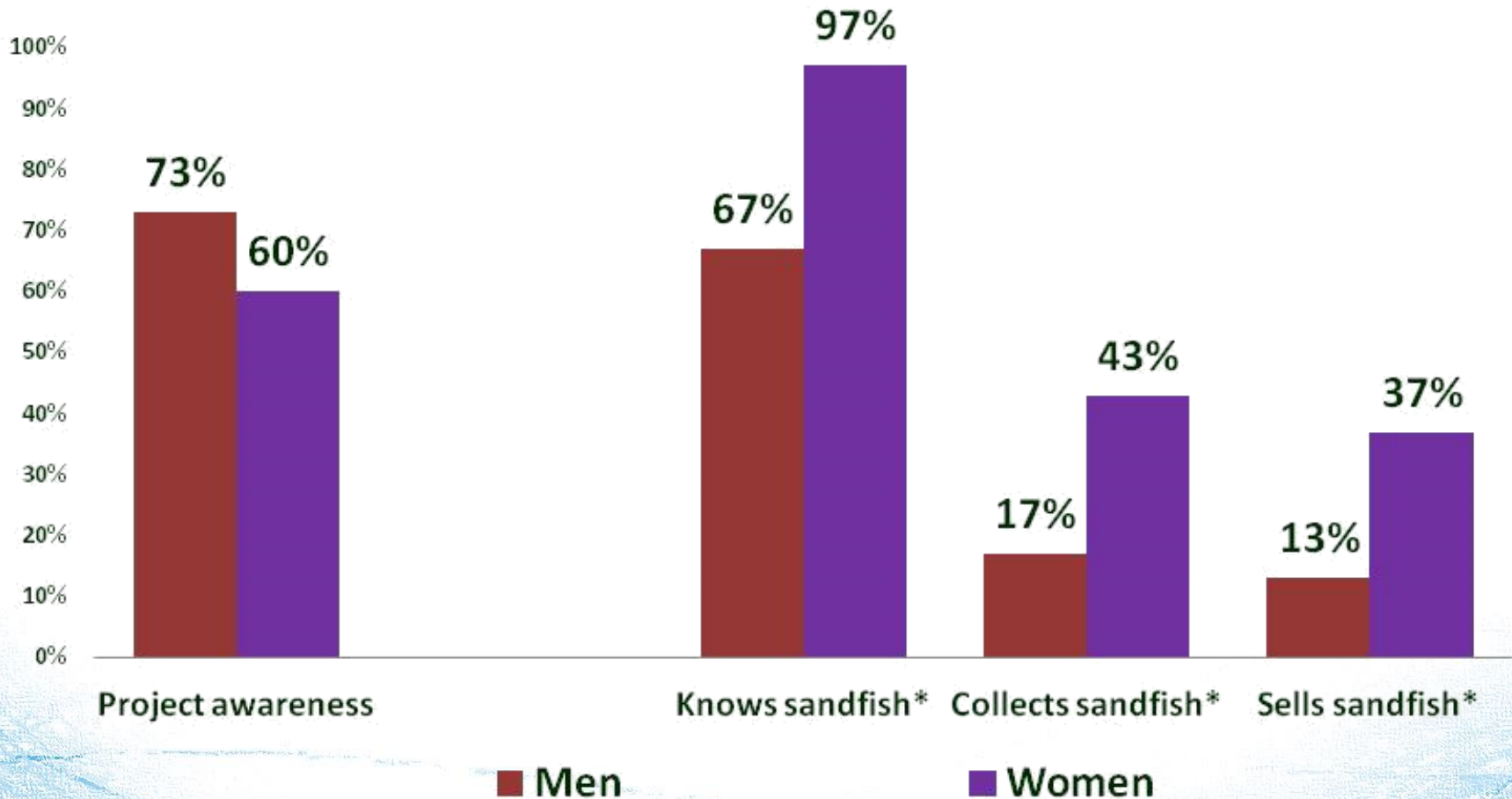
Governance and project management perceptions



Notes: *Significant at 0.05 level; assessed using a 10-point Likert scale

AWARENESS AND PERCEPTIONS

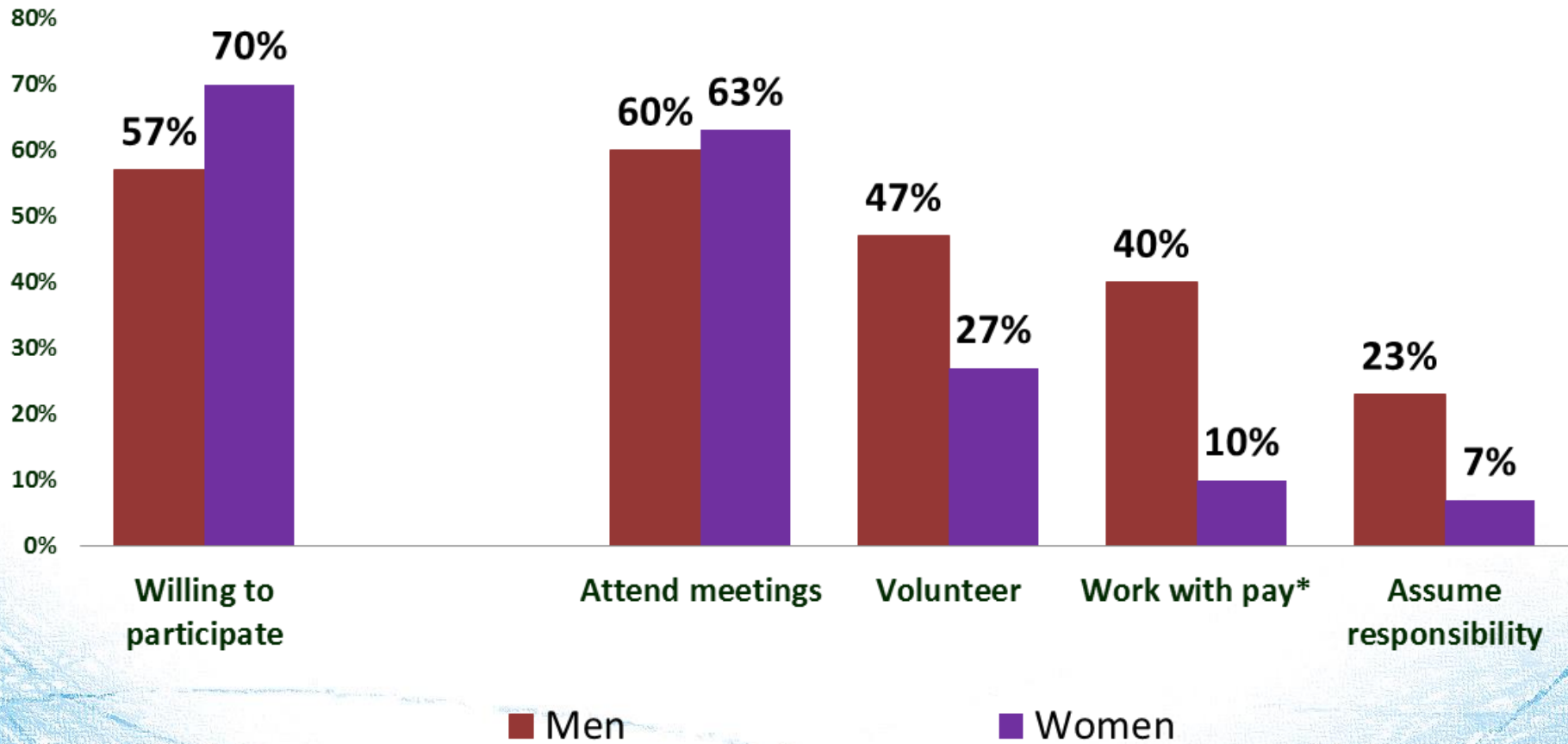
SC and project awareness



Notes: SC = sea cucumber (*H. scabra*) *Significant at 0.05 level

AWARENESS AND PERCEPTIONS

Project involvement



Note: *Significant at 0.05 level

FACTORS INFLUENCING PARTICIPATION

Logistic regression analysis

DV: “Willingness to participate in the project”

IV: Monthly income
Household income
Income diversity
Income multiplicity
Gender
Age
Years in school
Organizational membership
Project awareness
Governance

FACTORS INFLUENCING PARTICIPATION

All respondents

Men

Women

All fishers

FACTORS INFLUENCING PARTICIPATION

Respondents	Factor	Coefficient	S.E.	z-value	p-value	OR
All respondents	Gender (Women)	1.566	0.778	4.056	0.044	4.79
	Years in school	0.291	0.149	3.798	0.051	1.34
	Project awareness	2.903	0.803	13.069	0.000	18.22
Men	Years in school	0.793	0.347	5.224	0.022	2.21
	Project awareness	5.034	2.042	6.075	0.014	153.55
Women	Project awareness	2.416	0.952	6.447	0.011	11.20
Fishers	Years in school	0.425	0.187	5.141	0.023	1.53
	Project awareness	2.101	1.134	3.433	0.064	8.18
	Perceived benefits	2.340	1.084	4.657	0.031	10.38

Hosmer and Lemeshow test (GoF)

Model Summary

	Step	Chi ²	df	Sig.		Step	-2 Log likelihood	Cox & Snell R ²	Nagelkerke R ²
All respondents	9	10.272	7	0.174	All respondents	9	56.443 ^b	0.312	0.426
Males	9	3.720	7	0.811	Males	9	21.741 ^d	0.475	0.637
Females	8	5.650	8	0.686	Females	8	28.283 ^c	0.243	0.345
Fishers	8	9.292	8	0.318	Fishers	8	38.156 ^c	0.440	0.601

Note: Significance level: 0.05 and 0.10

Does gender matter?

1. Inequality in income and organizational membership
2. Women have lower trust on local organizations



Does gender matter?

3. Sandfish collection and trade were female-dominated
4. Women were less willing to be hired as laborers for the project



Danajon Bank, Bohol, Philippines © Claudio Contreras



Igang Bay, Philippines © C Recente, SEAFDEC/AQD

Does gender matter?

5. Gender is a factor of participation

6. Participation is incentive-driven



Does gender matter?

7. Knowledge building is essential in increasing men and women's interest to participate in the project.

8. The type of information required by men and women differ. Women may respond to **IEC's** while the men may want **technical knowledge**.





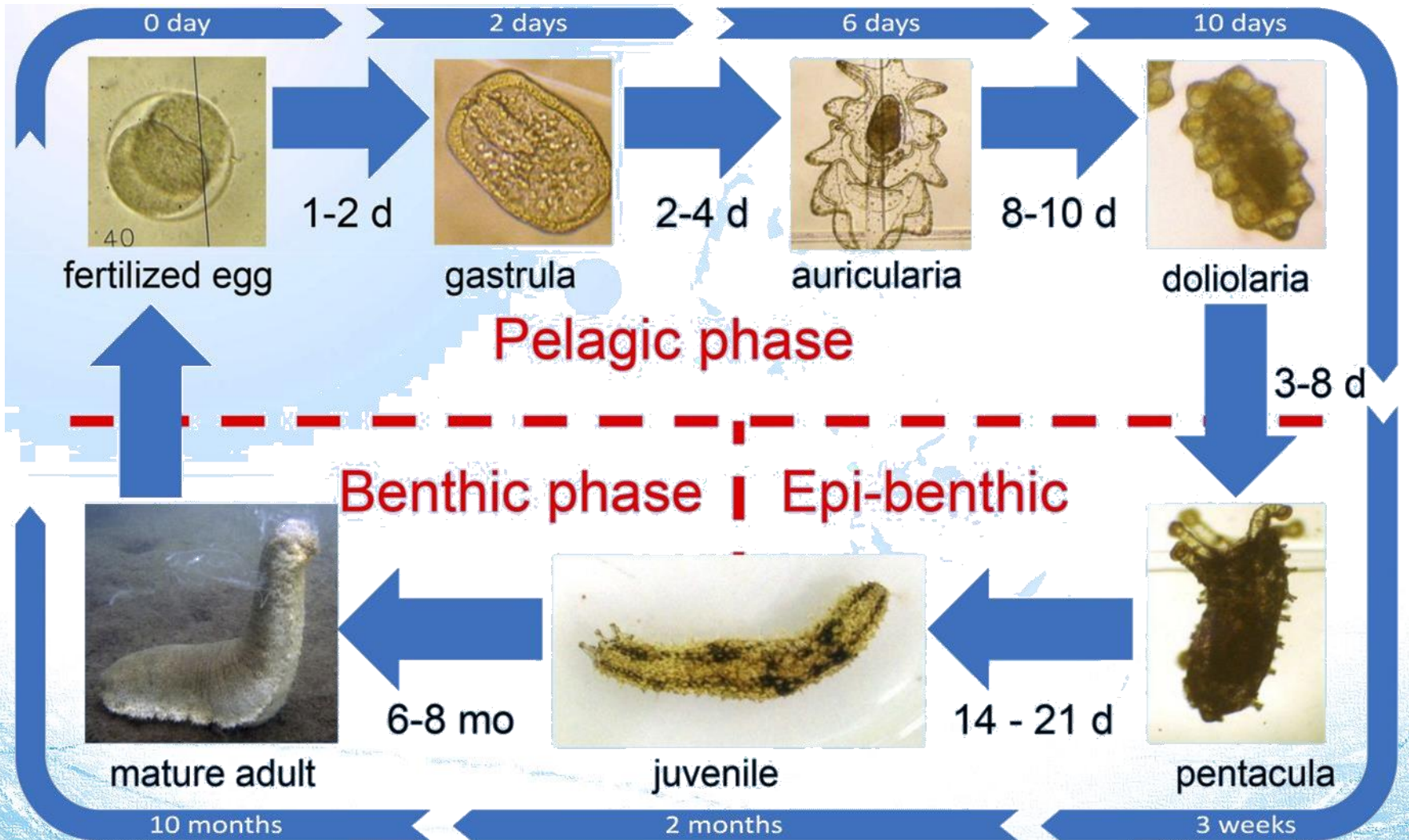
Thank you!



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- **Pandaraonan Unified Association**

Sandfish life cycle and production flow



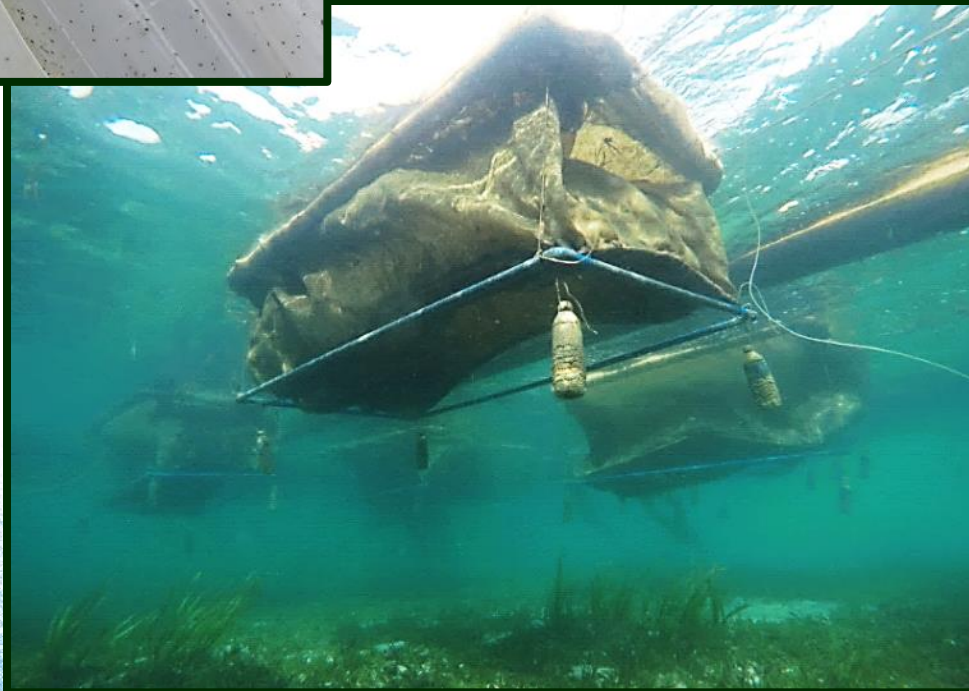


SEAFDEC/AQD

Sea Cucumber Hatchery

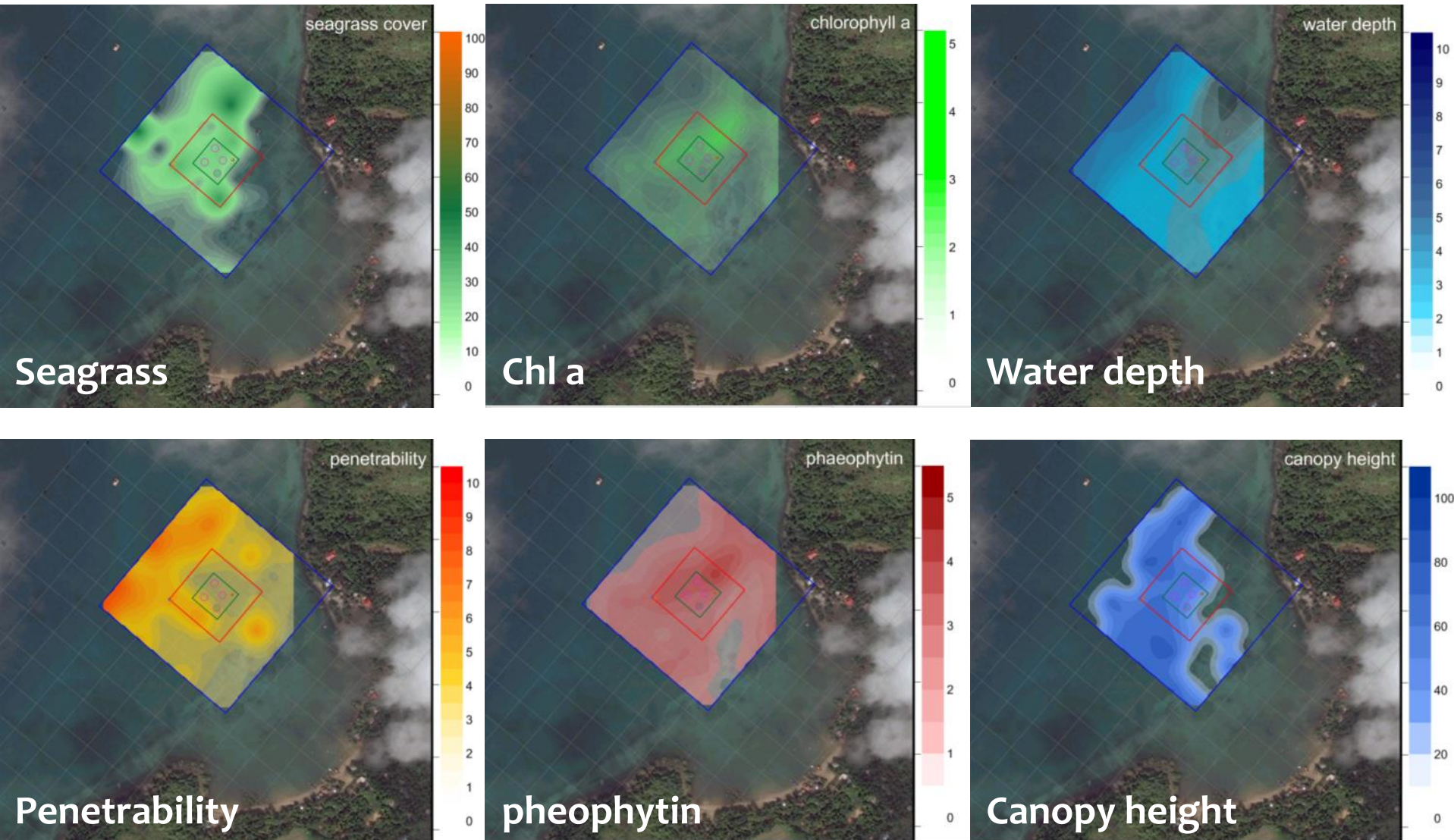
(constructed: 2010)

Sandfish spats
(30-40 d)



1-2 mo (3-6 g)

Parameters



Assessment



1 Bio-physical suitability assessment



2 Community orientation & public consultation (IEC)



3 Presentation to LGU & securing legal permits (use rights)



4 Planning workshop & partnership agreement (capability building)



5 Site delineation & development

ZONE A: CORE ZONE

(50 x 50 m)

No entry, Release
& monitoring only

ZONE B: NURSERY

(100 x 100 m), 1 ha

Restricted entry,
No fishing

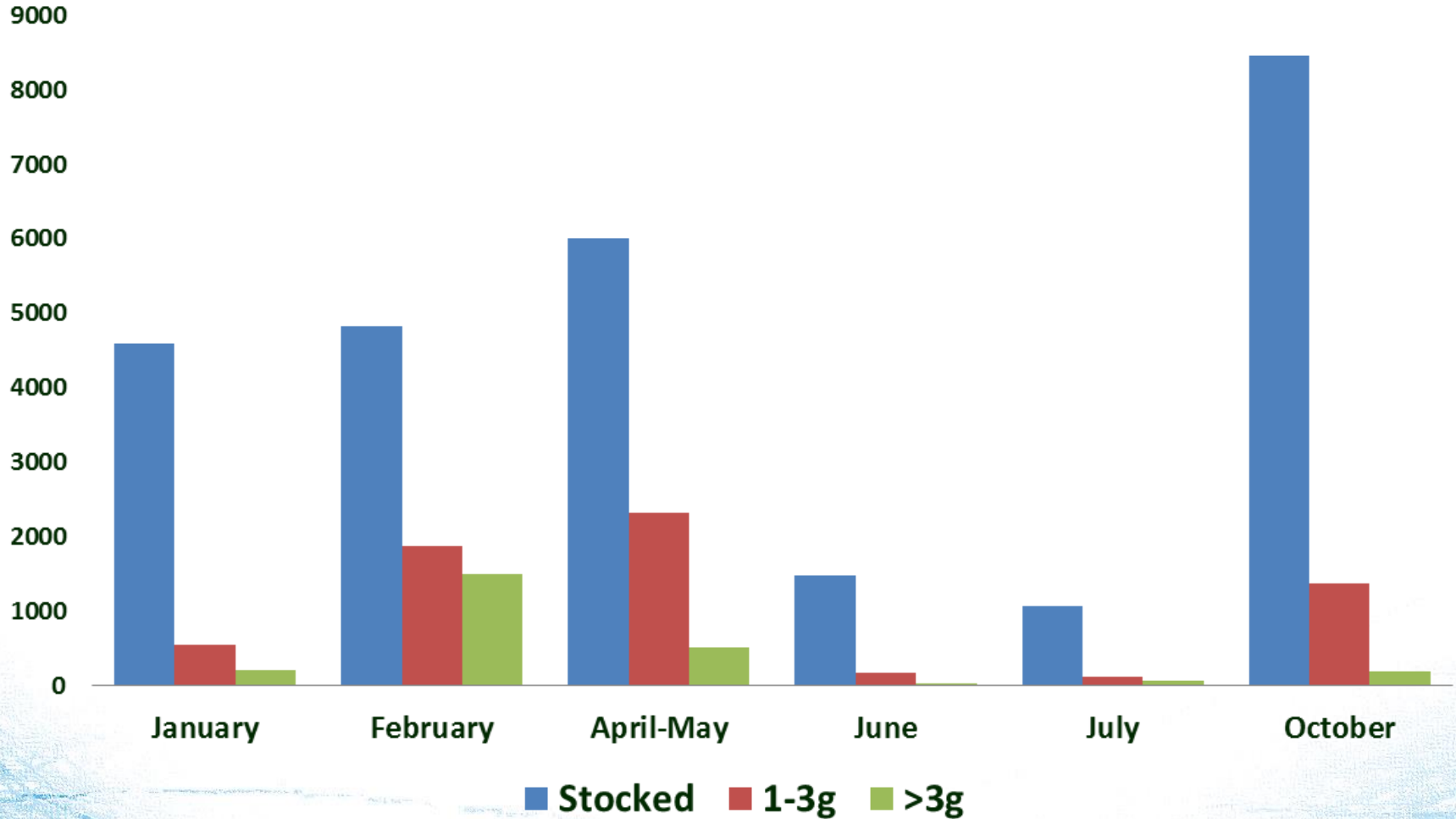
ZONE C: BUFFER

(250 x 250 m), ~5 ha

Entry allowed,
Restricted fishing



Quantity stocked and survival at >3g (1-2 mos), 2015



High mortality for stocks <3g ($p < 0.05$); survival stabilizes once stocks reach 3g

Problems in sea ranch sites



eel



swimming crab



hermit crabs



puffer fish



Poaching neighbors



Tonna shell

Intertidal area, Pandaraonan, Guimaras, Philippines, 2016



Pandaraonan, Guimaras © JP Altamirano, SEAFDEC/AQD



Pandaraonan, Guimaras © JP Altamirano, SEAFDEC/AQD