



The Role of Small-scale Fisheries in Food Security and Livelihoods in the Philippines



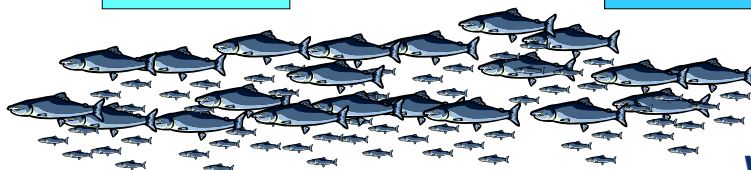
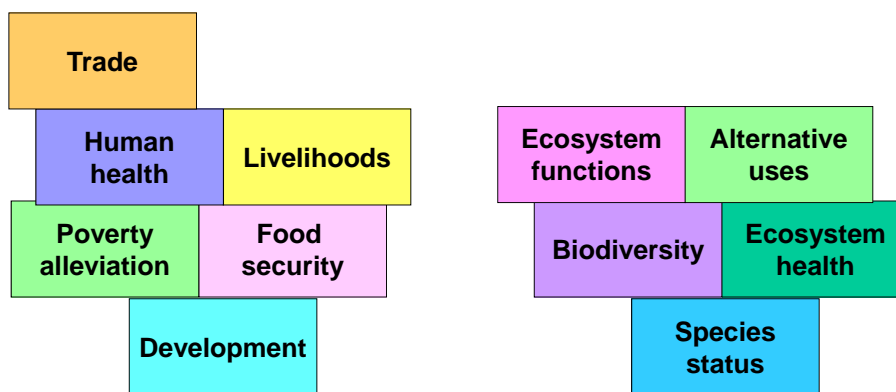
Len R. Garces
The WorldFish Center
Philippine Country Office

SEARCA – Agriculture and Development Seminar Series
 8 February 2011

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Philippine Fisheries: Importance



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Presentation Outline

- **Philippine Fisheries (Background)**
- **Why Focus on Small-scale Fisheries (Biophysical and Socioeconomic Characteristics)**
- **Way Forward (Fisheries Management and Strategies)**



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Philippine Fisheries: fishery resources

- | | |
|-----------------------------|---|
| 1. Total Territorial Water | 2,200,000 sq. km. |
| Area (including the EEZ) | |
| a. Coastal | 266,000 sq. km. |
| b. Oceanic | 1,934,000 sq. km. |
| 2. Shelf Area (Depth 200 m) | 184,600 sq. km. |
| 3. Coral Reef Area | 27,000 sq. km. |
| | (Within the 10-20 fathoms where reef fisheries occur) |
| 4. Coastline (length) | 36,289 km. |

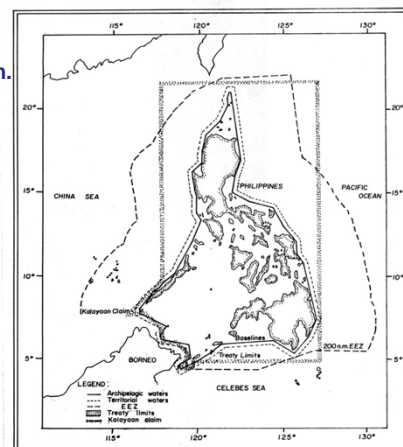


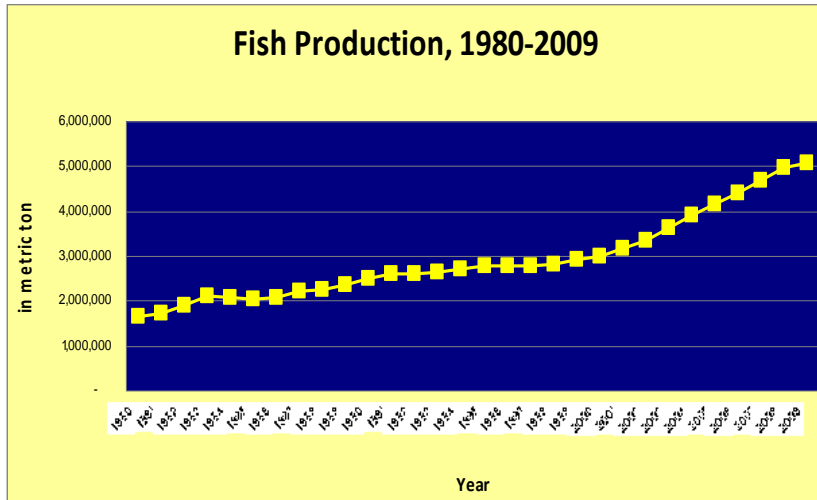
Figure 1. Map of the Philippines showing the limits of archipelagic, territorial waters, treaty limits, Exclusive Economic Zone, 200 N.M. EEZ, and 400-nautical mile claim.

Source: BFAR



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Philippine Fisheries: production trends

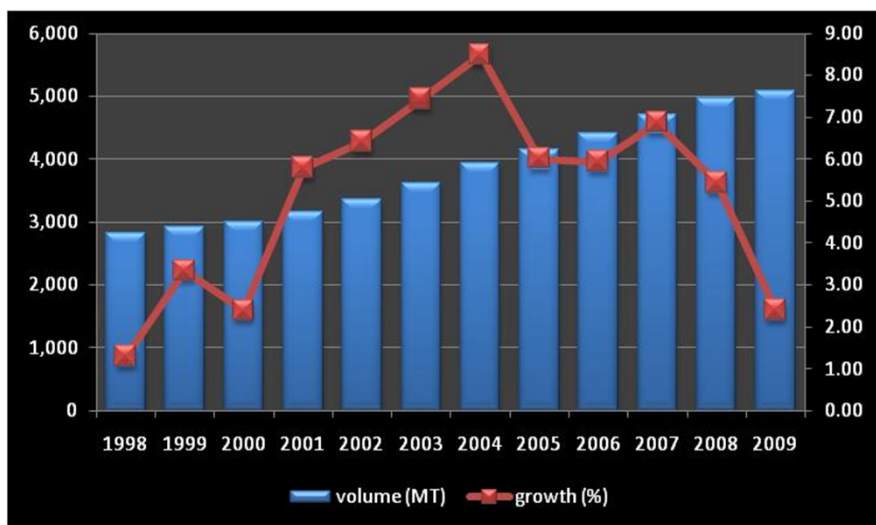


Source: BFAR

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Philippine Fisheries: production trends

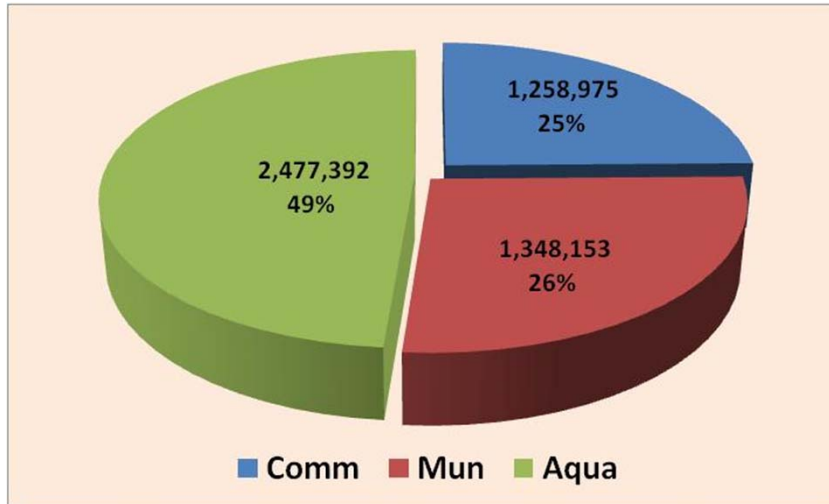


Source: BFAR

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Philippine Fisheries: production trends

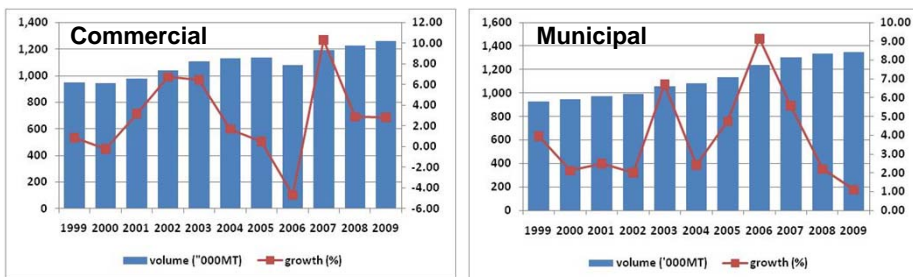


Source: BFAR

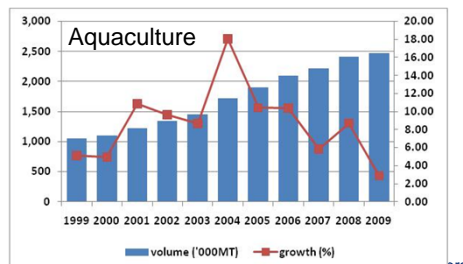
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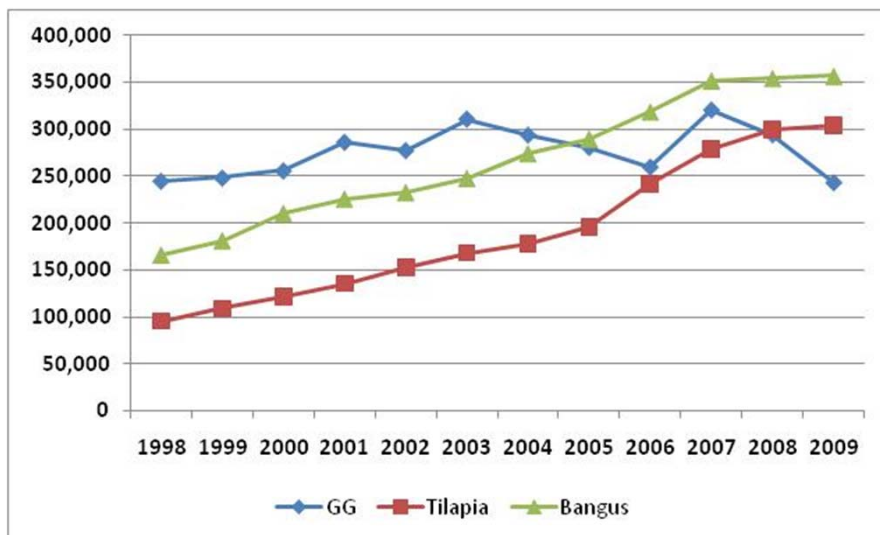
Philippine Fisheries: trends by sub-sector



Source: BFAR



Philippine Fisheries: trends (to 3 species)



Source: BFAR



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Per capita consumption of fish and products and percent to total food intake, by region, Philippines, 2003

Region	Per capita fish and products consumption		% of Total Food Consumption	% of fish, meat and poultry combined	Fish to Rice Ratio
	g/day	kg/year	%	%	
NCR	94	34.30	10.08	41.59	0.294
CAR	59	21.53	6.35	33.71	0.150
I - Ilocos	102	37.23	11.00	54.26	0.271
II - Cagayan Valley	69	25.18	8.12	46.31	0.177
III-Central Luzon	102	37.23	11.15	48.80	0.281
IV-A-CALABARZON	98	35.77	11.12	50.52	0.278
IV-B- MIMAROPA	96	35.04	10.26	57.48	0.241
V- Bicol	97	35.40	11.94	66.44	0.269
VI-Western Visayas	140	51.10	15.00	70.00	0.359
VII- Central Visayas	103	37.60	13.10	67.32	0.294
VIII- Eastern Visayas	122	44.53	15.01	72.62	0.342
IX- Zamboanga Peninsula	108	39.42	14.10	78.26	0.284
X- Northern Mindanao	101	36.86	10.82	63.92	0.250
XI- Davao Region	113	41.24	11.61	58.25	0.296
XII- SOCCSKSARGEN	117	42.70	13.03	68.82	0.292
XIII-CARAGA	105	38.32	11.85	66.88	0.273
ARMM	120	43.80	16.46	79.47	0.343
Total	104	37.96	11.74	56.22	0.286

Source: Food and Nutrition Research Institute, 2003.



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Philippine Fisheries: sufficiency trends

Item	2006	2007	2008	2009	2010
Total Fisheries Production in MT	4,409,611	4,850,572	4,966,889	5,085,977	5,489,528
Food Component:					
Fish Production in MT	2,893,336	3,395,400	3,476,822	3,560,184	3,842,670
Export in MT	117,285	128,472	205,274	225,801	248,382
Import in MT	123,536	136,671	208,370	229,207	252,128
Available Supply in MT	2,899,587	3,403,600	3,479,918	3,563,589	3,846,416
Population	86,923,590	88,618,599	90,346,662	92,108,422	93,904,536
Fish Requirement @ 36 kgc in MT	3,129,249	3,190,270	3,252,480	3,315,903	3,380,563
Sufficiency Level	92.46	106.43	106.99	107.47	113.78
Surplus/Deficit	(229,662)	213,331	227,438	247,686	465,852

Source: BFAR



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Philippine Fisheries: importance

Fisheries contribution to the Total GDP

- Constant Prices = 4.3% (P58.6B)
- Current Prices = 2.2% (P143.4B)

Fisheries contribution to GVA in Agriculture, Fishery and Forestry

- Constant Prices = 22.4 %
- Current Prices = 15 %

Employment

- Aquaculture - 226,195 operators
- Municipal - 1,371,679 operators
- Commercial - 16,497 operators

Balance of Trade*

- Fishery Exports = 189,851 MT = PhP25.7B
- Fishery Imports = 209,615 MT = PhP6.1B
- Trade Balance = (19,764 MT) = PhP19.6B

Source: BFAR



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Focus on Small-scale fishers

Estimated at 37.3 million in Asia, majority are in Southeast Asia

1.3 million of them are in the Philippines



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Small-scale Fisheries: Definition

“Small-scale fisheries can be broadly characterized as a dynamic and evolving sector employing labour intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources...

...This sub-sector, therefore, is not homogenous within and across countries and regions and attention to this fact is warranted when formulating strategies and policies for enhancing its contribution to food security and poverty alleviation.”

(FAO, 2004)

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SSF vs LSF

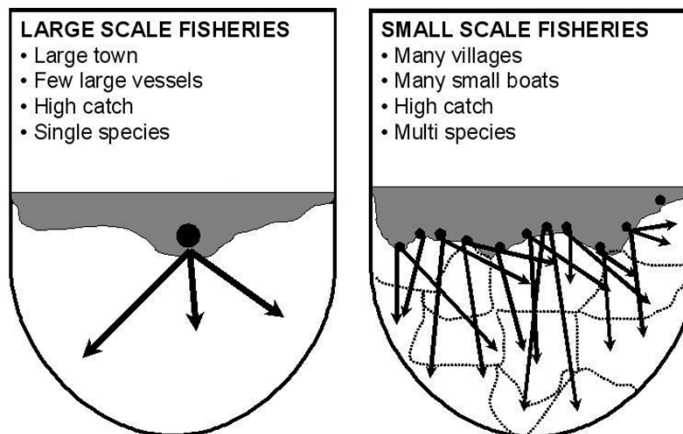
(Source: SEAFDEC Fisheries Bulletin)

Country	Small-scale fishery	Large-scale fishery
Brunei Darussalam	Artisanal; boats up to 60 ft (18.3 m) LOA (<3nm)	
Indonesia	Small-scale: vessels <5 GT/10 HP engine (0-3 nm); & <25 GT/50 HP engine (3-7 nm)	Industrial: vessels <100 GT/200HP engine (7-12 nm); & vessels >100GT/200HP engine (>12 nm to EEZ)
Malaysia	Inshore or traditional: boats <10 GT (within 3 nm)	Modern gear (Trawl & purse seine): boats >10 GT (>3nm)
Philippines	'Municipal' boats < 3 GT (<15 km, ~8 nm)	'Commercial' boats >3 GT (>15 km)
Thailand	<12 nm mainly gillnets	> 12 nm using trawl, purse seines, mackerel gillnet

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SSF vs LSF

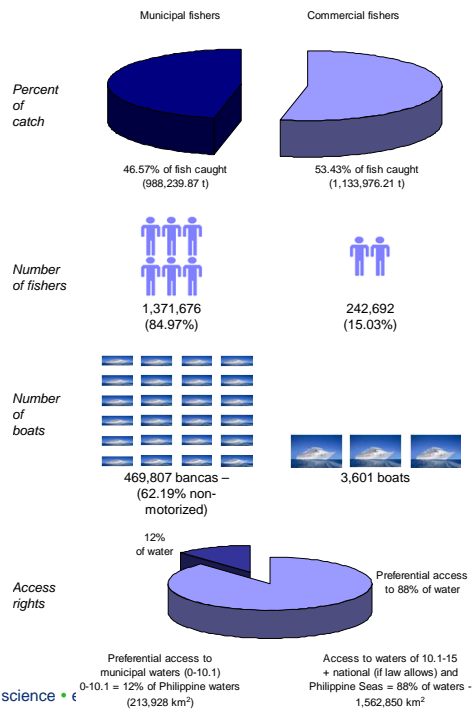


Adapted from Berkes 2003

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Philippine Fisheries: municipal vs commercial



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Number of municipal fishing vessels and estimates of catch per fishing vessel, by region, Philippines, 2007

Region	Motorized boats	Non-motorized boats	Total number of boats	Catch (mt)	Average Catch /boat/ year (mt)	Average Catch/boat/ day (kg)
NCR				6,017		
CAR	49	611	660	893	1.35	3.7
I – Ilocos	11,641	6,037	17,678	37,821	2.14	5.9
II - Cagayan Valley	1,502	1,802	3,304	27,284	8.26	22.6
III-Central Luzon	18,375	8,663	27,038	41,946	1.55	4.3
IV-A-CALABARZON	26,569	43,358	69,927	366,789	5.25	14.4
IV-B- MIMAROPA	combined with IV-A					
V- Bicol	19,453	35,262	54,715	128,277	2.34	6.4
VI-Western Visayas	16,234	25,574	41,808	149,012	3.56	9.8
VII- Central Visayas	19,100	37,042	56,142	51,819	0.92	2.5
VIII- Eastern Visayas	16,255	41,813	58,068	83,947	1.45	4.0
IX- Zamboanga Peninsula	13,280	32,370	45,650	119,580	2.62	7.2
X- Northern Mindanao	2,472	6,569	9,041	40,489	4.48	12.3
XI- Davao Region	11,382	12,717	24,099	34,403	1.43	3.9
XII- SOCCSKSARGEN	2,671	8,088	10,759	47,151	4.38	12.0
XIII-CARAGA	11,202	20,081	31,283	75,946	2.43	6.7
ARMM	7,442	12,193	19,635	92,982	4.74	13.0
Total	177,627	292,180	469,807	1,304,356	2.78	7.6
% of Total number of boats	37.81	62.19	100.00			

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Volume and percent share of catch of municipal and commercial sectors, by species, Philippines, 2007

	Municipal	% Share	Commercial	% Share	Total	% Share
Roundscad	75,544	6.6	244,671	20.5	320,215	13.8
Indian Sardines	72,601	6.4	134,310	11.3	206,911	8.9
Frigate tuna	67,836	6.0	123,636	10.4	191,472	8.2
Yellowfin tuna	51,832	4.6	82,660	6.9	134,492	5.8
Big-eyed scad	61,562	5.4	33,466	2.8	95,028	4.1
Fimbriated sardines	48,306	4.3	52,105	4.4	100,411	4.3
Indian mackerel	51,847	4.6	36,155	3.0	88,001	3.8
Slipmouth	34,062	3.0	28,552	2.4	62,613	2.7
Other species*	672,490	59.2	456,516	38.3	1,129,005	48.5
Total	1,136,079	100	1,192,070	100	2,328,149	100

*Including anchovy and squid among pelagic species and smaller volumes of grouper, snappers and other high value species. This also includes swimming crabs, shrimps and sea cucumbers in relative smaller volumes.

Source: BFAR. Philippines Fisheries Profile 2007



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Municipal fish catch from 1995 to 2002 by fishing grounds (mt)

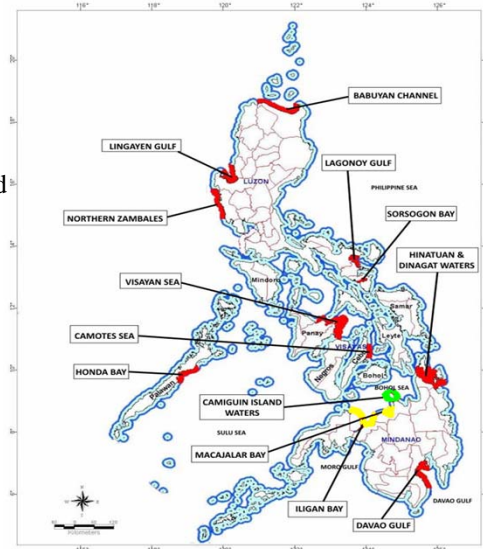
Fishing Ground	1995	2002	% Annual Change
1 Visayan Sea	88,616	92,885	0.007
2 Moro Gulf	73,938	74,765	0.002
3 East Sulu Sea	71,486	78,491	0.014
4 Bohol Sea	70,756	84,305	0.027
5 Guimaras Strait	51,332	55,106	0.011
6 Leyte Gulf	49,901	36,587	-0.038
7 West Palawan Waters	46,948	38,444	-0.026
8 South Sulu Sea	42,019	44,000	0.007
9 Lamon Bay	41,862	37,138	-0.016
10 Samar Sea	40,236	35,622	-0.016
11 Davao Gulf	33,743	28,365	-0.023
12 Cuyo Pass	25,587	27,253	0.009
13 Tayabas Bay	17,498	22,500	0.041
Others	131,447	152,063	0.022
Total	785,369	807,524	0.004



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Philippine Fisheries: NSAP Results

- - Highly fished
- - Moderately fished
- - Slightly fished



Source: BFAR - NFRDI

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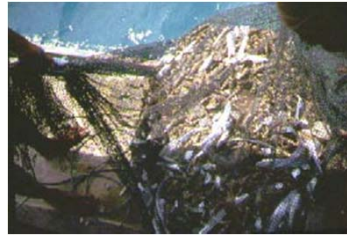
Fishing gears used by municipal fishers, by type of fishing vessel, by type of organization/ownership, 2003, Philippines

Type of Fishing Gear/ Accessories/Device	All vessel types	Boat with engine		Boat without engine		Raft
		With outrigger	No outrigger	With outrigger	No outrigger	
Beach seine net	28,784	12,331	1,981	10,723	2,489	1,260
Cast net	25,804	8,167	2,222	6,298	6,858	2,358
Cover pot	11,614	2,862	291	3,127	4,809	525
Crab hook	23,843	9,340	1,512	10,379	2,218	394
Crab pot	19,338	5,162	1,134	8,816	3,777	449
Drive-in net	21,823	6,339	1,460	7,340	5,330	1,354
Filter net	5,761	1,386	741	1,298	1,883	453
Fish finder	27	3	10	-	-	14
Fish pot	19,664	5,268	2,376	7,714	3,489	817
Fish aggregating devise	9,108	5,016	803	2,143	694	453
Fish trap	41,841	10,343	4,788	11,854	12,827	2,029
Fishing light	174,479	81,129	8,321	69,398	12,014	3,617
Fyke net	7,631	1,790	1,287	1,770	1,421	1,363
Gill net/Entangling net/						
Drift net	228,745	102,908	9,669	79,242	29,902	7,023
Hook and line	388,004	150,475	17,228	185,213	28,747	6,341
Hoop net	7,223	2,205	794	2,290	1,506	428
Lambaklad net	4,050	3,100	950	-	-	-
Luring device	14,656	5,141	3,201	5,421	867	25
Modified Danish seine	13	5	8	-	-	-
Purse seine	16	5	11	-	-	-
Push net	37,188	11,900	1,679	13,441	8,106	2,062
Ranger boat	17	2	5	-	1	9
Scoop net	106,576	48,958	3,089	46,897	4,750	2,882
Service boat	317	26	12	13	1	265
Sonar	11	3	-	-	-	8
Squid jig	141,677	56,316	6,863	72,105	5,838	555
Trawl net	25	17	8	-	-	-
Others	241,961	96,049	6,267	114,634	19,608	5,403

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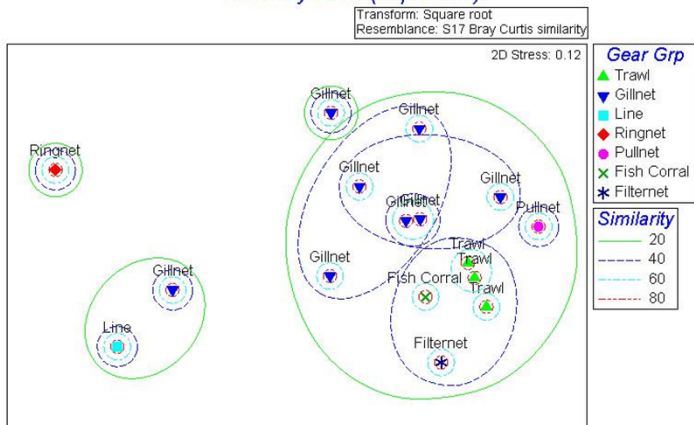
San Miguel Bay: Fishing gears



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Gear – Species Overlaps: San Miguel Bay

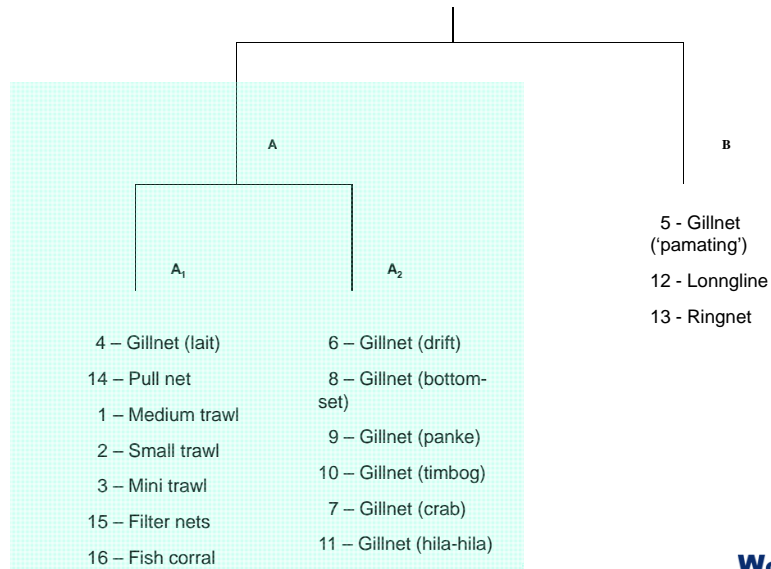
Catch by Gear (in percent)



Source: Garces & Silvestre 2010

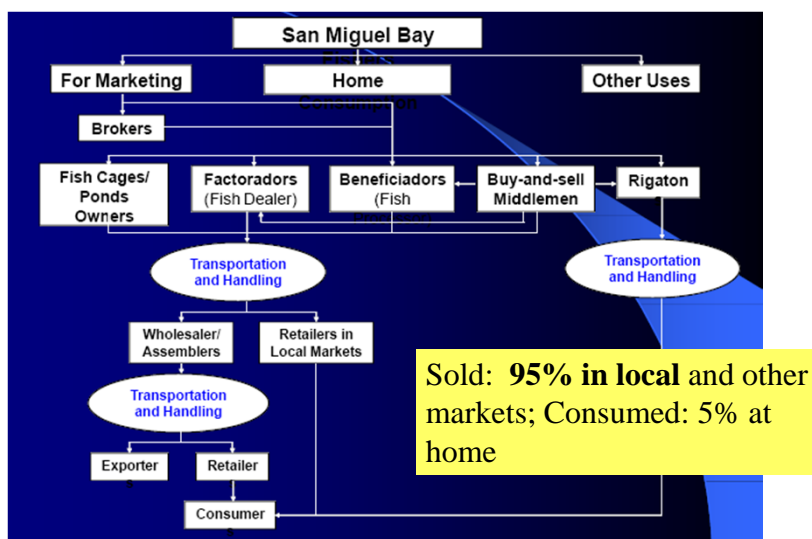


Gear – Species Overlaps: San Miguel Bay



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Marketing trends – San Miguel Bay



Source: SSF Governance Study in San Miguel Bay



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Number of small-scale fishers by age group and gender distribution, Philippines, 2002

Age group	Total Number of Municipal Fishing Operators*	% of Total	Gender		
			Male	Female	Not reported
15-19	26,288	1.77	23,869	2,073	346
20-24	78,845	5.32	75,483	2,719	643
25-29	155,664	10.50	149,921	4,602	1,141
30-34	214,153	14.45	206,053	6,738	1,362
35-39	229,957	15.52	219,732	8,546	1,679
40-44	211,475	14.27	201,583	8,711	1,180
45-49	174,554	11.78	166,070	7,390	1,094
50-54	141,530	9.55	132,842	7,880	808
55-59	92,754	6.26	85,978	6,204	572
60-64	73,369	4.95	66,538	6,329	502
65 and over	81,048	5.47	72,152	8,271	625
Not reported	2,334	0.16	1,436	82	816
Total	1,481,970	100.00	1,401,657	69,546	10,767
% Distribution	100.00		94.58	4.69	0.73

*Refer to household-based operation

Source: NSO. 2002 Census of Fisheries

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Number of small-scale fishers by level of education, Philippines, 2002

Level of Education	Total Number of Municipal Fishing Operators*	% of Total	Gender		
			Male	Female	Not reported
No grade completed	69,535	4.69	64,130	445	953
Undergraduate elementary	442,638	29.87	419,614	20,175	2,850
Graduated elementary	421,313	28.43	400,297	18,382	2,634
High school undergraduate	223,057	15.05	211,005	10,413	1,640
High school graduate	217,911	14.70	207,218	9,459	1,234
Post secondary course	18,428	1.24	17,766	536	125
College undergraduate	49,633	3.35	46,559	2,777	297
College graduate	35,117	2.37	31,731	3,184	202
Post graduate	1,367	0.09	1,256	105	6
Cannot remember	2,970	0.20	2,082	62	826
Total	1,481,970	100.00	1,401,657	69,546	10,767
% Distribution	100.00		94.58	4.69	0.73

*Refer to household-based operation

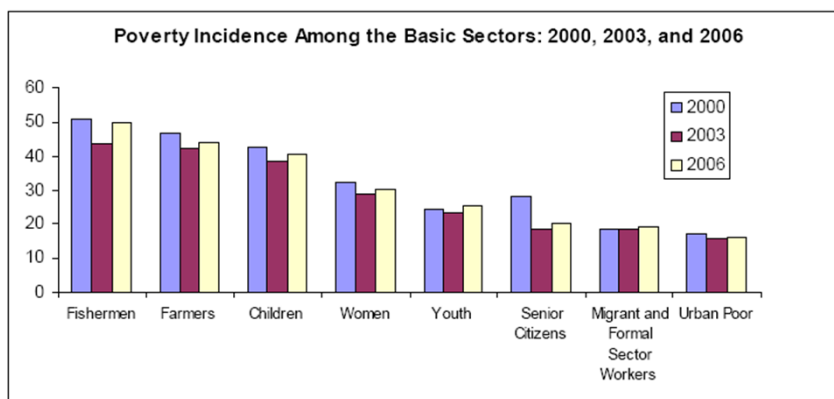
Source: NSO. 2002 Census of Fisheries

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Fisheries Sector: Poverty incidence

Fishermen is one of the sectors with the highest poverty incidence (i.e., 49% in 2006)



Source: NSCB



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Fisheries Sector: Poverty incidence

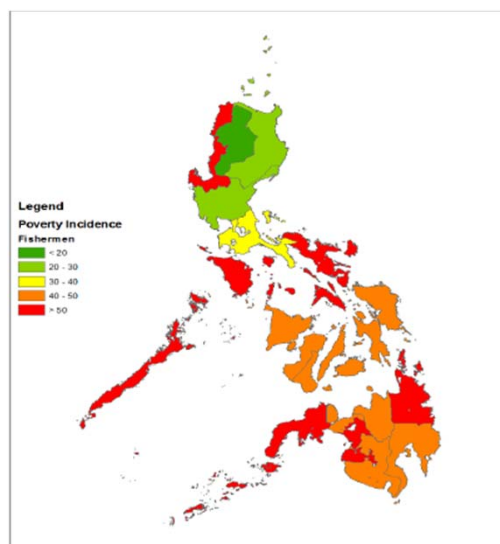
SECTOR	POVERTY INCIDENCE		REGION	
	Highest	Lowest	Poorest	Least Poor
Fishermen	66.7	23.9	1 Caraga 2 ARMM 3 Region V	1 Region III 2 Region II 3 NCR
Children	66.3	15.2	1 ARMM 2 Region IVB 3 Region VIII	1 NCR 2 Region III 3 Region IVA
Farmers	62.3	16.9	1 ARMM 2 Region IX 3 Region X	1 Region II 2 Region III 3 Region I
Women	58.9	9.7	1 ARMM 2 Region IVB 3 Caraga	1 NCR 2 Region III 3 Region IVA
Youth	53.2	7.3	1 ARMM 2 Caraga 3 Region IVB	1 NCR 2 Region IVA 3 Region III
Urban Poor	52.4	7.4	1 ARMM 2 Region IVB 3 Caraga	1 CAR 2 Region IVA 3 NCR
Senior Citizens	46.5	4.4	1 ARMM 2 Region IX 3 Caraga	1 NCR 2 Region III 3 Region II
Migrant and Formal Sector Workers	36.8	4.8	1 Caraga 2 Region IVB 3 Region V	1 NCR 2 Region IVA 3 Region VII

Source: NSCB



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Fisheries Sector: Poverty incidence



Source: BFAR



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MDG performance on Goal 1: Eradicating poverty & hunger

	Percent share of population living on less than US\$1.25 a day (2008)	Approximate number of people (million) (2008)	Prevalence of malnutrition (% underweight children under age 5)
Brunei	no data	no data	no data
Cambodia	40	6	28 (2006)
Indonesia	no data	no data	24 (2006)
Lao PDR	36	2	36 (2000)
Malaysia	2		no data
Myanmar	no data	no data	30 (2003)
Philippines	23	19	21
Thailand	2	0.3	3
Vietnam	23	19	20

Source: <http://devdata.worldbank.org/atlas-mdg/>

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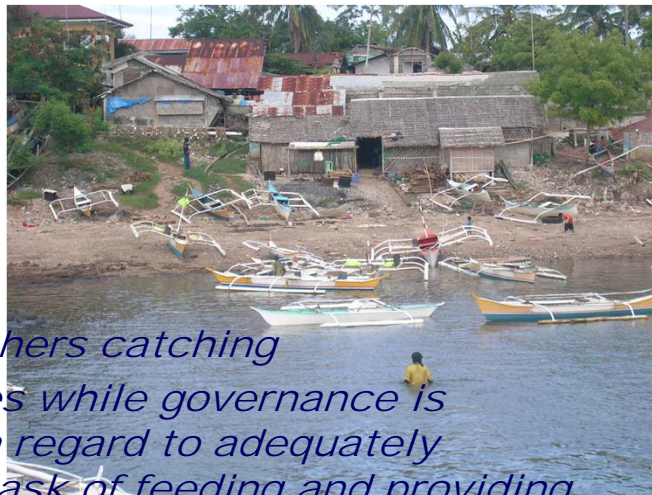
Why target small-scale fisheries?

- Significant leap in the MDG milestone could be achieved
- Fisheries in SEA and in the Philippines is self-sustaining fish producing sector
- In 2020, SEA is projected to produce 1 million tonnes of fish beyond consumption levels and feed people in deficit areas (Delgado, et al. 2003)



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Small-scale fisheries problem



Too many fishers catching too few fishes while governance is wanting with regard to adequately meeting its task of feeding and providing livelihoods to millions



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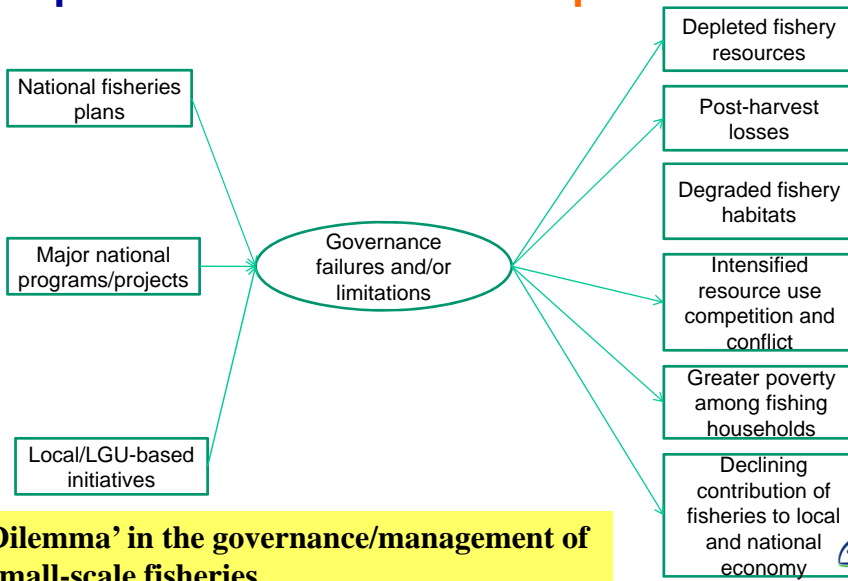
Capture Fisheries: issues & problems

- Resource declines and overcapacity
- Habitat and environmental degradation
- Decreasing biodiversity
- Increasing resource use conflicts
- Governance failure
- External drivers (e.g., Climate Change)



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Capture Fisheries: issues & problems



Dilemma' in the governance/management of small-scale fisheries



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Policies and Fisheries Management

Main Legislations:

- RA 8550 (Fisheries Code) establishes coastal resource management as the approach for managing coastal and marine resources (1998)
- RA 8435 (AFMA) recognizes the importance of fisheries to food security and provides for Integrated Coastal Management Training (1997)
- RA 7160 (LGC) devolves primary mandate for managing municipal waters to LGU (1991)



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Policies and Fisheries Management

Executive/Administrative Orders:

- EO 241 creates Fisheries and Aquatic Resources Management Councils (FARMCs) (1995)
- FOO 217 Adoption and implementation of the Integrated Fisheries Management Unit (IFMU) scheme (June 2008)
- FOO 213 Adoption and implementation of the Comprehensive National Fisheries Industry Development Plan (June 2008)
- EO 533 Adopting ICM as a national strategy to ensure sustainable development (June 2006)



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Policies and Fisheries Management

Regional/International “Consensus”/Instruments:

- Resolution & Plan of Action on Sustainable Fisheries for Food Security for the ASEAN Region (2001)
- Regional Guidelines for Responsible Fisheries (RCCRF) including supplementary guidelines (1998-2006)
- Strategic Plan of Action (SPA) for the ASEAN Cooperation in Fisheries (2005-2010), Strategic Thrust 6: Management, Sustainable Utilization and Conservation of Natural Resources
- Regional Plan of Action to Promote Responsible Fishing Practices including Combating IUU Fishing in the Region (2007)



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Policies and Fisheries Management

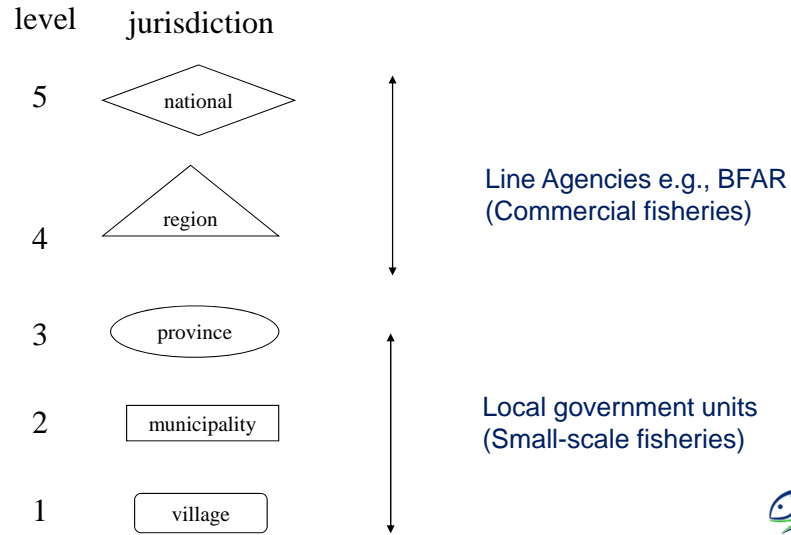
BFAR & LGU Interventions:

- Licensing and permit system
- Closed areas (e.g., Fish Sanctuaries or Refugia, MPAs)
- Closed seasons (species and area based)
- Restricting fishing methods (including mesh size regulation and technological restrictions)
- Allowable catch levels, quotas and size limits (???)



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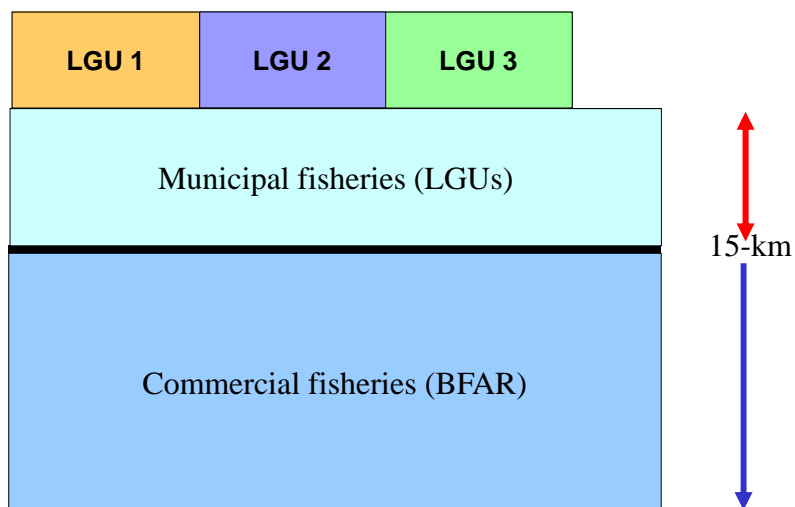
Administrative levels for governance of marine fisheries in the Philippines



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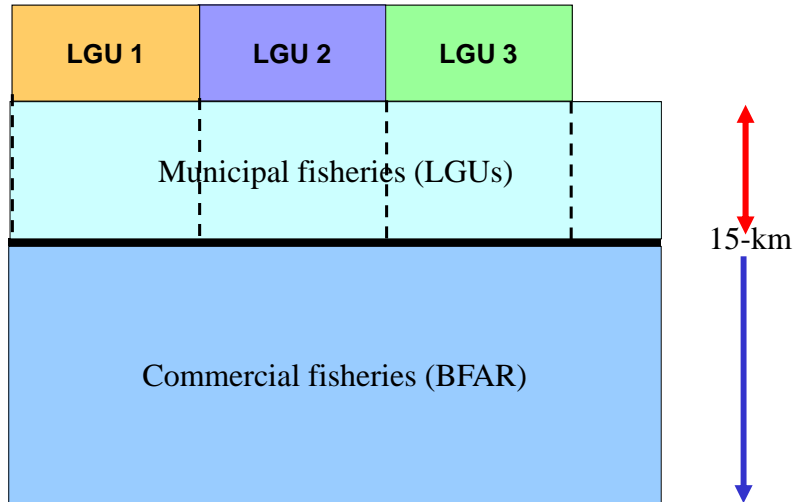
Fisheries Management: Modality 1



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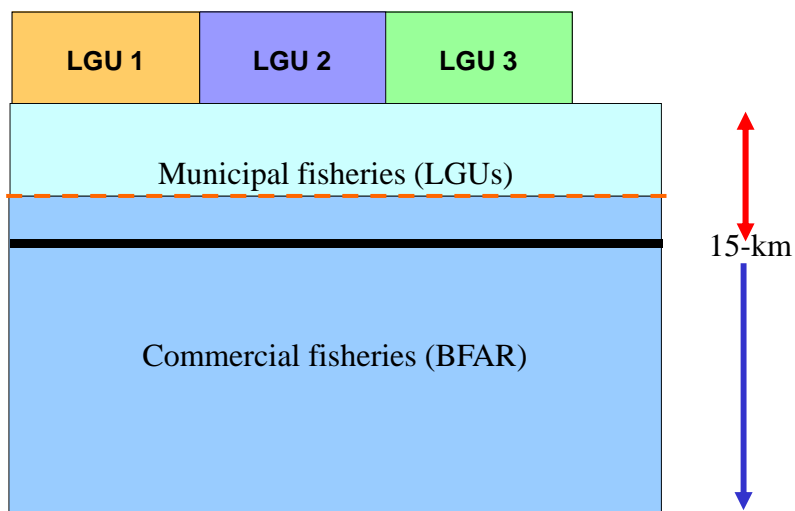
Fisheries Management: Modality 2



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Fisheries Management: Modality 3

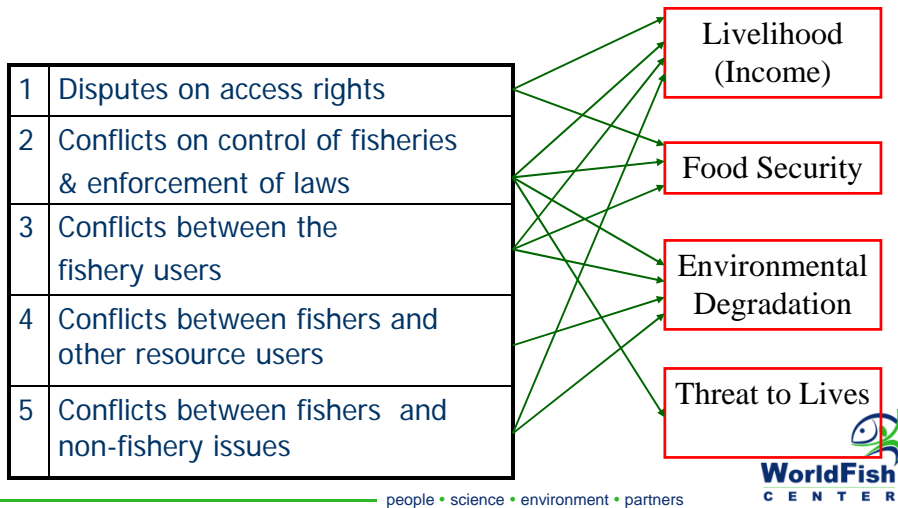


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Fisheries: Typology of resource use conflicts and security concerns

Unresolved Fisheries Conflicts may Cause Threats to Food and Livelihood



Fisheries: Strategies

Interventions



Governance failures and/or limitations

Problems/Issues



Strategies

1. Sustain
2. Preserve
3. Protect
4. Capacitate
5. Integrate
6. Communicate



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Management Strategies: **Sustain**

- Improve municipal fisheries registration and licensing
- Harmonize relevant policies/regulations
- Minimize post-harvest losses



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Management Strategies: **Protect/Preserve**

- Rehabilitate degraded fisheries habitats/ecosystems (stock rebuilding)
- Increase number and enhance networks of protected areas (fish sanctuaries)
- Enhance fisheries law enforcement
- Protect native biodiversity



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Management Strategies: **Develop**

- Promote sustainable fisheries livelihoods
- Improve product along the value chain
- Establish appropriate infrastructure facilities (post harvest and fish processing)
- Use market-based instruments (payment of ecosystem services)
- Direct efforts in less exploited fishing grounds
- Link small-scale fisheries with other economic sectors (Ecosystem Approach to Fisheries – EAF)



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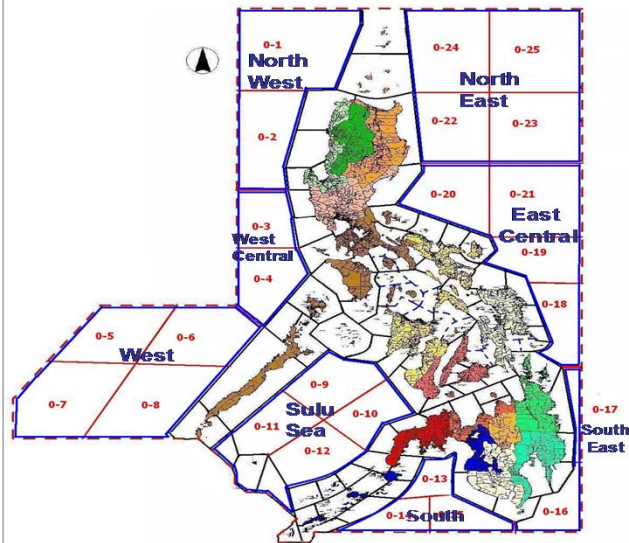
Management Strategies: **Capacitate & Integrate**

- Continue capacity building at local level (LGUs)
- Promote organizational integration (e.g., alliances, bay-wide management councils)
- Scale-up fisheries management (e.g., IFMU)
- Partnerships (tap more non-traditional partners)



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⊕ The IFMU Scheme



FOO 217 Adoption and implementation of the Integrated Fisheries Management Units (IFMU) scheme (BFAR, June 2008)



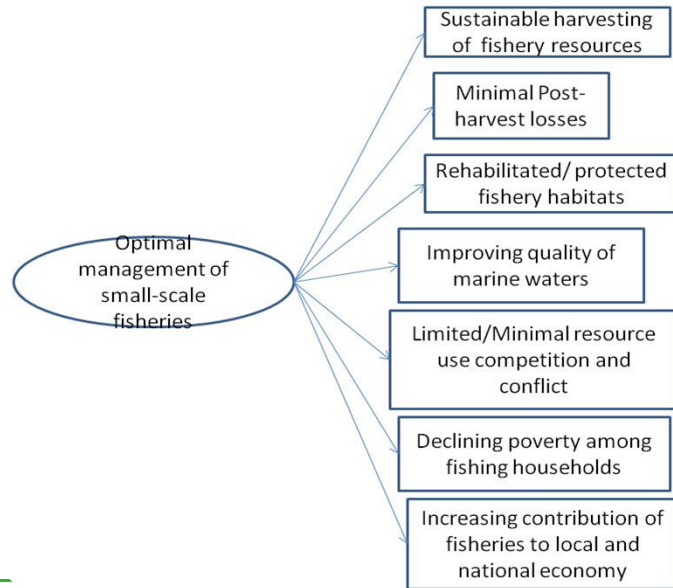
Management Strategies: **Communicate**

- Implement a comprehensive education program
- Design a practical monitoring and evaluation system
- Clarify property rights/regimes
- Improve on fisheries data/information system
- Undertake more research on gender issues
- Transform research results into usable formats and IEC



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Fisheries Management/Governance: Indicators



...Small-scale fisheries are hard to measure, so their importance to food security and livelihoods is often underestimated...

Thank You

www.worldfishcenter.org

This presentation was based on the e following projects/reports:

- “Strengthening Governance and Sustainability of Small-Scale Fisheries Management in the Philippines: An Ecosystem-based Fisheries Management Approach” (January 2009 – September 2011)
- Fish Fights Over Fish Rights - Managing exit from the fisheries and security implications for Southeast Asia (February 2003 – July 2005)

- N. Salayo, **L. Garces**, M. Pido, K. Viswanathan, R. Pomeroy, M. Ahmed, I. Siason, K. Seng, A. Masae. 2008. Managing excess capacity in small-scale fisheries: Perspectives from stakeholders in three Southeast Asian countries. *Marine Policy*, 32: 692-700.
- **Garces, L.R.**, M.D. Pido, R.S. Pomeroy. 2008. Fisheries in Southeast Asia: Challenges and Opportunities, p. 171-182. In Pandya, A. and E. Laipson (Eds.) *Transnational Trends: Middle Eastern and Asian Views*. The Henry L. Stimson Center, Washington, DC.
- Pomeroy, R., **L. Garces**, M. Pido, G. Silvestre. 2010. Ecosystem-based fisheries management in small-scale tropical marine fisheries: Emerging models of governance arrangements in the Philippines. *Marine Policy*, 34: 298-308.
- **Garces, L.R.**, G. Silvestre. 2010. An evaluation of resource overlaps among fishing gears in the coastal fisheries using multivariate techniques. *J. Mar. Biol Ass. India*, 52 (1): 1-7.
- Salayo, N.D. and M.L. Perez. 2009. Small time, big numbers, small attention, big task: The role of small-scale fisheries and small-scale aquaculture in food security and livelihoods in southeast Asia. Paper Presented at the East Asian Congress, 23 November 2009, Manila.
- Perez, M.L., Pido, **Garces, L.R.** et al. (in prep) , t A White Paper on Sustainable Development of Small-Scale Fisheries (SSF) in the Philippines: Past Initiatives, Present Situation, Lessons Learned and Strategic Directions.



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