Results on
the Indicators for Management of Fisheries *Refugia:*

STANDARDIZED METHODS FOR COLLECTION AND ANALYSIS OF DATA AND INFORMATION, FOR THE USE IN ASSESSING THE IMPACTS OF FISHERIES REFUGIA AND IN THE DESIGNING OF APPROPRIATE INDICATORS FOR LONG TERM MANAGEMENT OF THE REGIONAL SYSTEM OF FISHERIES REFUGIA
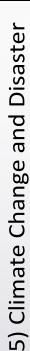
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FINAL DRAFT FOR DISCUSSION

Dimensions	Sub-Dimensions	Criteria	Indicators
1) Ecosystem	Fisheries Resources	Abundance stock / Distribution / Effort	Biomass Estimation
			Level of MSY
			Level of MEY
			Level of CPUE
			CPUA
			Catch landing
		Biological Parameter	Length at first capture (Lc)
			Length at first mature (Lm)
			Sex ratio
			Spawning Potential Ratio
			Length frequency
			GSI (Gonadosomatic Index)
		Species composition / Catch structure	Percentage of dominance species
			Number of species
			% Main economic species
			% Main commercial species
			Percentage of Bycatch
	Habitat (mangrove, coral, seagrass)	Healty/condition/Area	Size Coverage
			Healthy Index
			Status of target habitat density
			Size Coverage
	Environment (Impact from human act.)	Pollution	Standard Water Quality (e.g. COD,BOD)
		Eutrophication	Phytoplankton Abundance
			Phosephate, Nitrate Concentration
		Anthropogenic (Human activity)	Coastal reclamation area
			Level of maritime activity
		Erosion	Level and distribution of maritime activity
			List of area/habitat

Dimensions	Sub-Dimensions	Criteria	Indicators
2) Social	Livelihoods	Diversity of Occupation	Number of option/ Occupation/ work (Alternative, Permanent work, Sub sistant work)
		Food security (Fish consumption, Fish consumtion/Capital)	Fish consumtion/Capita/year
	Stakeholder Participation(Indigenous People, Gender, etc)	Participation	Ratio/Number of participation
		Local Organization	Number of organization, ratio of gender and IP
		Networking	Number of networking
			Type /way of direc or indirec communication
			Number of agreement
	Education (Local knowledge, Local wisdom)	Awareness program(Info. Center, IEC)	Number of Information Center
			Number of consultation
			Number of best practice
			Number of awareness program
			Number of understanding by stakeholder
		Capacity building	Number of training/Extension
3) Economic	Economic Condition (to community)	Poverty incident	Poverty Index
		Capital accessibility	Number of financial accessible
			household income
		Income	Income/household
	Fisheries Production, Efforts	Contribution of target species	Value of contribution/production
	Inovative Fisheries Technology	Effectiveness fishing gear	Level of production, or level of CPUE
		Efficiency fishing gear	Length limit
		Cost effectiveness	Cost reduction ,time, human power
		Environment friendly (Green technology)	Reduce of fuel consumption
			Reduce bycatch
		Investment	Number of investment (for e.g. fishing fleet, processing, ship builder, management tools/software, etc.)
			New of domestic product

Dimensions	Sub-Dimensions	Criteria	Indicators
4) Governance	Fisheries management policy (Fishing/User Right, Precaustionary appoaches/Science-based management, and Synergistic Way/Strategy)	Legal framework	Number of law and regulation
		Harvest strategy/ Limit of fishing effort	Closed season
			control)
			Number of output control (TAC, Quota)
		Fisheries management plan/ strategy/ framework	Management plan of Fisheries refugia in place
	Stakholder Cooparation/Coordination (Regional / national levels)	Management mechanism	Management board/ committee, transboundery committee, RPOA for refugia inplace
	Enforcement	Coordination mechanism	Inter agency coordination inplace,Number of joint operation
		Fishery Law enforcement	Level of enforcement
			Frequency of regular patrol
			Number of violation prosecution
	Capacity Building	Best Practice	Adoption of best practice in place
		Maritime policy /regulation and International policy	Number of training/workshop
	Funding (Infrastructure, Enforcement, etc.)	Sustainability	Long term commitment of Government on finance
		Source of funding (incentive, soft loan, donation/CSR)	Number of donor
			Type of fund
		incentive	Type of incentive
			Number of activity
			Number of best practice

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5) Climate Change and Disaster	**Fish Stock**	Impact to Fish Stock	Availability/levels of knowledge abundance, distribution, genetic diversity, recruitment
			Update information impact to fish stock
	Impact to Habitat	Coral bleaching	Area
			Incident/ frequency
			Recovery Rate
		Destruction of mangrove	Area coverage
			Recovery Rate
		Destruction of sea grass	Area coverage
			Recovery Rate
		Ocean acidification	PH level
			Carbonate (CO3) Level
	Impact to Environment	Sea level	Saline instrution
			Mean sea level annual
		Physical/chemical parameters (T, Salinity, PH, DO)	Level of physical and chemical parameters
		Precipitation (rainfall)	Level of Precipitation