## Appendix X. Results of the causal chain analyses for Main Area of Concern 03: Declines in Living Marine Resources

Table A3.1: Environmental Impacts of Declines in Living Marine Resources -(Severity)

Environmental Impacts	3.1.1.	3.1.2.	3.1.3.	3.1.4.	3.2.1.	.2.2.	3.2.3.	.2.4.	.2.5.	3.3.1.	.3.2	3.3.3	3.3.4	3.3.5	3.3.6	3.4.	.5
	'n	'n	ĸ	ĸ	ъ	э.	3.	ĸ	3.	ĸ	3	ĸ	3.	ď	'n	κ.	ď
	marine mammals	cetaceans	seabirds	turtles	sharks and rays	large pelagics	small pelagics	deep water demersals	reef and demersal fish	molluscs (bivalves, gastropods)	cephalopods	sea cucumbers	prawns and shrimp	lobsters	crabs	Excessive bycatch and discards	Expansion of mariculture industry
Loss of biodiversity	1	3	1	1	3	3	1	3	3	2	1	2	1	1	1	4	
Loss of marine biomass (and productivity)	1	2		1	4	4	3	2	3	1	1	2	2	2	1	3	
Enhanced risk of extinction of vulnerable or endangered species	4	1		2	3	2	1	3	3		1	3				3	
Reduction in genetic diversity of wild populations (meta-populations) and implications for their long term survival	2	1		2	3	2	1	3	3		1	3				3	
Reduction in genetic diversity of wild commercial stocks (e.g. reduction in proportion of fast growing and late spawning individuals).					3	2	1	3	3		3	3	1	1		3	
Trophic cascades (food-web impacts)	1	2	1	1		3	1	3	3				1	1		3	
Trophic cascades (food-web impacts) associated with the removal of apex predators			1		4	3			3							3	
Trophic cascades associated with other keystone predators (e.g. Lethrinids and sea urchins)					3	3			3							3	
Decline in ornamental species									3								
Change in community composition (increase / decrease in herbivores)								2	3			1					
Increased illegal fishing and more intense pressure in protected areas								2	3			4		3			
Changes in nutrient cycling pathways	1	1	1		1		1		2	1		1	1	1		3	2
Reduction in the control of nuisance species (e.g. Turtles - Jellyfish)				1	2				1							3	2
Shifts in benthic cover / composition as the result of the loss of the species / group									3	1		2	1	3			
Reduction in food available to other species (food-web cascade) as a result of fishery						2	3		3	2		2	2	1		3	
Impacts upon sedimentary processes (accretion and bioerosion)									1	2		3					
Physical impacts on the seabed from trawls and other mobile gear (e.g. dredges)									3				3	1	1	3	

Environmental Impacts	1.1.	3.1.2.	3.1.3.	3.1.4.	3.2.1.	3.2.2.	3.2.3.	3.2.4.	3.2.5.	3.3.1.	3.3.2	3.3.3	3.3.4	3.3.5	3.3.6	3.4.	3.5.
	e,	'n	Ř	33	3.	3	3	ĸ	ĸ	œ.	ĸ	ĸ	3	κi	ĸ	ĸ	ĸ
	marine mammals	cetaceans	seabirds	turtles	sharks and rays	large pelagics	small pelagics	deep water demersals	reef and demersal fish	molluscs (bivalves, gastropods)	cephalopods	sea cucumbers	prawns and shrimp	lobsters	crabs	Excessive bycatch and discards	Expansion of mariculture industry
Increased use of poisons, and associated impacts on nursery habitats and coral reefs, seagrass beds and other shallow									3	1				1			
Increased use of dynamite fishing impacts on coral reefs									3							3	
Trampling impacts									3	2		2	1	1			
Reduction in food available to other species (food-web cascade) as a result of feed production							3		3								3
Potential introduction of alien species by aquaculture									2				1				3
Biosecurity issues associated with mariculture resulting of diseases in wild-stocks												1	1				3
Changes in water quality										1		1	1			1	4

Table A3.2: Inter-relationship between Declines in Living Marine Resource issues and other issues.

3.1.1	3.1.2	3.1.3	3.1.4	3.2.1	3.2.2	3.2.3	3.2.4	3.2.5	3.3.1	3.3.2	3.3.3	3.3.4	3.3.5	3.3.6	3.4.	3.5.	Issue	
marine mammals	cetaceans	seabirds	turtles	sharks and rays	large pelagics	small pelagics	deep water Jemersals	reef and demersal	molluscs (bivalves,	cephalopods	sea cucumbers	prawns and shrimp	lobsters	crabs	Excessive bycatch and	Expansion of	maricultura industrv	
																<b>→</b>	1.3.1	Microbiological contamination from land-based and marine sources
											<b>→</b>	<b>→</b>				<b>→</b>	1.3.2	Nutrient enrichment from land-based and marine (mariculture) sources
																<b>→</b>	1.3.3	Chemical contamination (excluding oil spills) from land-based and marine sources
					<b>→</b>							<b>→</b>				<b>*</b>	1.3.4	Suspended solids in coastal waters due to human activities
								<b>→</b>									1.3.5	Solid wastes / marine debris (plastics etc.) from shipping and land-based-sources
					<b>→</b>												1.3.6	Oil spills (drilling, exploitation, transport, processing, storage, shipping).
												<b>→</b>					2.2.5.	Disturbance, damage and loss of estuarine habitats
								<b>*</b>	<b>→</b>			<b>→</b>		<b>→</b>			2.2.6.	Disturbance, damage and loss of mangrove habitats
				+	<b>→</b>	<b>→</b>		<b>→</b>	<b>→</b>	<b>→</b>	<b>→</b>		<b>→</b>			<b>→</b>	2.3.1.	Disturbance, damage and loss of coral reef habitats
								<b>→</b>		<b>→</b>	<b>→</b>	<b>→</b>				<b>→</b>	2.3.2.	Disturbance, damage and loss of seagrass habitats
										<b>→</b>	<b>→</b>	<b>→</b>				<b>→</b>	2.3.3.	Disturbance, damage and loss of macroalgal habitats
											<b>→</b>	<b>→</b>				<b>→</b>	2.3.4.	Disturbance, damage and loss of soft sediment habitats
							1						<b>→</b>	<b>→</b>			2.3.5.	Disturbance, damage and loss of deep water habitats (including sea mounts)
<b>→</b>	<b>→</b>			<b>→</b>	<b>→</b>	<b>→</b>									<b>→</b>	<b>→</b>	2.4.	Disturbance, damage and degradation of pelagic habitats
			<b>→</b>					<b>→</b>									2.6.	Introduction of exotic non-native species, invasives and nuisance species
						<b>→</b>				<b>→</b>							3.1.2.	Decline in populations of cetaceans
					<b>→</b>	<b>→</b>									<b>→</b>		3.1.3.	Decline in populations of seabirds
					<b>→</b>	<b>→</b>											3.2.1.	Decline in populations of sharks and rays
		<b>→</b>															3.2.3.	Decline in populations of small pelagics
									<b>→</b>	<b>→</b>	<b>→</b>	<b>→</b>	<b>→</b>	<b>→</b>	<b>→</b>	<b>→</b>	3.2.5.	Decline in populations of reef and demersal fish
																<b>*</b>	3.3.3.	Decline in populations of sea cucumbers
																<b>→</b>	3.3.4.	Decline in populations of prawns and shrimp

→ 3.3.6. Decline in populations of crabs

Table A3.3.: Ecosystem Services affected by environmental impacts of Declines in Living Marine Resources

		PR	OVIS	IONII	NG SE	RVIC	ES				REG	ULAT	ING S	SERV	ICES			SU	JPPO	RTIN	G	C	ULTU	RAL8	& AM	ENIT	Y SEF	RVICE	S
Environmental Impacts	Pro01	Pro02	Pro03	Pro04	Pro05	Pro06	Pro07	Pro08	Reg01	Reg02	Reg03	Reg04	Reg05	Reg06	Reg07	Reg08	Reg09	Sup02	Sup02	Sup03	Sup04	Cul01	Cul02	Cul03	Cul04	Cul05	Cul06	Cul07	Cul08
Environmental Impacts	Food (e.g. fish, game fruit)	Freshwater (e.g. for drinking, irrigation, cooling)	Raw materials (e.g. fibre, timber, fuel wood,	Genetic resources (e.g. for crop improvements	Biochemical medicines and pharmaceuticals (e.g.	Ornamental resources (e.g. artisan work,	Geological resources*	Energy*	Air quality regulation (e.g. Capturing dust,	gulation (e.g. Ca	Natural hazard regulation (e.g. Storm protection	Regulation of water flows (e.g. Natural drainage,	Waste treatment (especially water purification)	Erosion regulation / prevention	Nutrient cycling and maintenance of fertility (incl.	Pollination	Biological control (e.g. Seed dispersal, pest and	Maintenance of life cycles (incl. nursery,	Maintenance of genetic diversity (gene pool	Photosynthesis and primary production*	Secondary production*	Aesthetics information	Opportunities for recreation, tourism and lifestyle	Inspiration for culture, art and design (Cultural	Spiritual experience	Bequest, intrinsic and existence*	nformation for cognitive development	Social relations*	Sense of place*
Loss of biodiversity	<b>1</b>	ш	Œ	<b>1</b>	В			ш	_ (	0		- (*	>	ш		а.	ш			Ь	S	<b>1</b>	<b>↑</b>	<b>^</b>	<b>↑</b>	<b>1</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>
Loss of marine biomass (and productivity)	<b>1</b>							<b>1</b>																					
Enhanced risk of extinction of vulnerable or endangered species	<b>1</b>																<b>1</b>	<b>1</b>	<b>↑</b>		<b>1</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>+</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>
Reduction in genetic diversity of wild populations (meta- populations) and implications for their long term survival	<b>1</b>			<b></b>													<b>1</b>	<b>1</b>	<b>1</b>		<b>1</b>								
Reduction in genetic diversity of wild commercial stocks (e.g. reduction in proportion of fast growing and late spawning individuals).	<b>1</b>			<b>↑</b>													<b>↑</b>	<b>1</b>	<b>↑</b>		<b>1</b>						<b>↑</b>		
Trophic cascades (food-web impacts)	1			1													1	<b>1</b>	<b>1</b>		1						1		
Trophic cascades (food-web impacts) associated with the removal of apex predators	<b>1</b>			<b>1</b>													<b>1</b>	<b>1</b>	<b>1</b>		<b>1</b>								
Trophic cascades associated with other keystone predators (e.g. <i>Lethrinids</i> and sea urchins)	<b>1</b>										<b>↑</b>			<b>1</b>	<b>↑</b>		<b>1</b>	<b>1</b>	<b>↑</b>		<b>1</b>								
Decline in ornamental species	<b>1</b>			<b>1</b>		<b>1</b>											<b>1</b>	<b>1</b>	<b>1</b>			<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>			
Change in community composition (increase / decrease in herbivores)	<b>1</b>													<b>1</b>	<b>↑</b>		<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>								
Increased illegal fishing and more intense pressure in protected areas	<b>1</b>																					<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>1</b>			

		PR	ovis	IONI	NG SE	RVIC	ES				REGI	ULAT	ING S	SERV	ICES			SU	JPPO	RTIN	IG	C	ULTU	RAL	& AIV	IENIT	Y SER	VICE	S
Environmental Impacts	Pro01	Pro02	Pro03	Pro04	Pro05	Pro06	Pro07	Pro08	Reg01	Reg02	Reg03	Reg04	Reg05	Reg06	Reg07	Reg08	Reg09	Sup02	Sup02	Sup03	Sup04	Cul01	Cul02	Cul03	Cul04	Cul05	Cul06	Cul07	Cul08
Environmental Impacts	Food (e.g. fish, game fruit)	reshwater (e.g. for drinking, irrigation, cooling)	Raw materials (e.g. fibre, timber, fuel wood,	Genetic resources (e.g. for crop improvements	Biochemical medicines and pharmaceuticals (e.g.	Ornamental resources (e.g. artisan work,	Geological resources*	Energy*	Air quality regulation (e.g. Capturing dust,	Climate regulation (e.g. Carbon sequestration,	Natural hazard regulation (e.g. Storm protection	Regulation of water flows (e.g. Natural drainage,	Naste treatment (especially water purification)	Erosion regulation / prevention	Nutrient cycling and maintenance of fertility (incl.	Pollination	Biological control (e.g. Seed dispersal, pest and	Maintenance of life cycles (incl. nursery,	Maintenance of genetic diversity (gene pool	Photosynthesis and primary production*	Secondary production*	Aesthetics information	Opportunities for recreation, tourism and lifestyle	nspiration for culture, art and design (Cultural	spiritual experience	3equest, intrinsic and existence*	nformation for cognitive development	ocial relations*	Sense of place*
Changes in nutrient cycling pathways	<b>↑</b>	ш	~	G	В	0	G	Ш	⋖	O	Z	~	>	Ш	<b>↑</b>		В	_2	_2	<b>↑</b>	<b>↑</b>	_∢	0		S	В	_=	Š	Š
Reduction in the control of nuisance species (e.g. Turtles - Jellyfish)	<b>^</b>														_		<b>1</b>	<b>1</b>	<b>1</b>		_	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	1			
Shifts in benthic cover / composition as the result of the loss of the species / group	<b>1</b>			<b>1</b>							<b>1</b>			<b>1</b>	<b>1</b>		<b>↑</b>	<b>^</b>	<b>↑</b>										
Reduction in food available to other species (food-web cascade) as a result of fishery	<b>^</b>			<b>1</b>							<b>1</b>			<b>1</b>	<b>^</b>		<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>^</b>	<b>↑</b>	<b>↑</b>							
Impacts upon sedimentary processes (accretion and bioerosion)	<b>^</b>						<b>↑</b>							<b>1</b>	<b>↑</b>							<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>		<b>↑</b>	<b>↑</b>
Physical impacts on the seabed from trawls and other mobile gear (e.g. dredges)	<b>^</b>					<b>1</b>				<b>1</b>	<b>1</b>			<b>1</b>	<b>1</b>							<b>1</b>	<b>↑</b>	<b>↑</b>	<b>^</b>	<b>^</b>		<b>↑</b>	
Increased use of poisons, and associated impacts on nursery habitats and coral reefs, seagrass beds and other shallow	<b>^</b>					<b>↑</b>					<b>^</b>			<b>1</b>			<b>\</b>	<b>1</b>	<b>\</b>	<b>↑</b>	<b>1</b>	<b>1</b>	<b></b>	<b></b>	<b>1</b>	<b>^</b>		<b>→</b>	
Increased use of dynamite fishing impacts on coral reefs	<b>1</b>					<b>1</b>					<b>1</b>			<b>1</b>			<b>↑</b>	<b>1</b>	<b>↑</b>	<b>^</b>	<b>↑</b>	<b>^</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>1</b>		<b>↑</b>	
Trampling impacts	<b>1</b>					<b>1</b>					<b>1</b>			<b>1</b>			<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>↑</b>	<b>1</b>	<b>1</b>	<b>^</b>		<b>1</b>	
Reduction in food available to other species (food-web cascade) as a result of feed production	<b>^</b>			<b>1</b>													<b>↑</b>									<b>+</b>		<b>↑</b>	
Potential introduction of alien species by aquaculture	1			1													<b>↑</b>	<b>1</b>	<b>1</b>							<b>1</b>		<b>1</b>	
Biosecurity issues associated with mariculture resulting of diseases in wild-stocks	<b>^</b>			<b>1</b>													<b>^</b>	<b>↑</b>	<b>↑</b>							<b>^</b>		<b>↑</b>	
Changes in water quality	<b>^</b>											<b>1</b>			<b>1</b>			<b>1</b>	<b>1</b>	<b>^</b>	<b>^</b>	<b>^</b>	<b>↑</b>	<b>↑</b>	<b>1</b>	<b>^</b>		<b>1</b>	

Table A3.4: Socio-economic impacts as a result of the loss of Ecosystem Services due to Declines in Living Marine Resources

			PROV	ISIONII	NG SEF	RVICES					R	EGULA	TING S	ERVICE	:S		
	Pro01	Pro02	Pro03	Pro04	Pro05	Pro06	Pro07	Pro08	Reg01	Reg02	Reg03	Reg04	Reg05	Reg06	Reg07	Reg08	Reg09
Socio-economic Impacts	-ood (e.g. fish, game fruit)	reshwater (e.g. for drinking, irrigation, cooling)	Raw materials (e.g. fibre, timber, fuel wood, fodder,	Genetic resources (e.g. for crop improvements and medicinal numoses)	Biochemical medicines and pharmaceuticals (e.g.	:	Geological resources*	Energy*	Air quality regulation (e.g. Capturing dust, chemicals,	Climate regulation (e.g. Carbon sequestration, influence of vegetation on rainfall etc.)	Natural hazard regulation (e.g. Storm protection and	Regulation of water flows (e.g. Natural drainage,	Waste treatment (especially water purification)	Erosion regulation / prevention	Nutrient cycling and maintenance of fertility (incl. soil formation)*	Pollination	Biological control (e.g. Seed dispersal, pest and dispersal, pest and
Increased malnutrition							J			<u> </u>							
Reduction in food availability / security due to trophic cascades	+																
Reduction in food availability / security (local) due to local overexploitation	+																
Reduction in food availability / security (local) due to destructive / non-selective gear by local vessels	+																
Reduction in food availability / security (local) due to destructive / non-selective gear used by foreign industrial vessels	+																
Increased food prices for local community	+																
Increased operational costs for fishers	+																
Increased cost of living for local community	+																
Increased migration (people) leading to social issues	+																
Abuse of office by government officers	+																
Increased non-compliance (illegal fishing)	+																
Increased rent-seeking behaviour (bribery) by government officers	+																
Change in gear and increased use of destructive fishing practices	+																

			PROV	ISIONII	NG SEF	RVICES					R	EGULA	TING S	ERVIC	ES		
	Pro01	Pro02	Pro03	Pro04	Pro05	Pro06	Pro07	Pro08	Reg01	Reg02	Reg03	Reg04	Reg05	Reg06	Reg07	Reg08	Reg09
Socio-economic Impacts	Food (e.g. fish, game fruit)	Freshwater (e.g. for drinking, irrigation, cooling)	Raw materials (e.g. fibre, timber, fuel wood, fodder,	Genetic resources (e.g. for crop improvements and medicinal numbers)	Biochemical medicines and pharmaceuticals (e.g.	رم د	Geological resources *	Energy*	Air quality regulation (e.g. Capturing dust, chemicals,	Climate regulation (e.g. Carbon sequestration, influence of vegetation on rainfall etc.)	Natural hazard regulation (e.g. Storm protection and	Regulation of water flows (e.g. Natural drainage,	Waste treatment (especially water purification)	Erosion regulation / prevention	Nutrient cycling and maintenance of fertility (incl. soil formation)*	Pollination	Biological control (e.g. Seed dispersal, pest and dispasse control)
Reduction in opportunities for recreation, tourism and leisure due to loss of biodiversity																	
Reduction in aesthetics 'landscape/seascape' value of the natural environment																	
Reduction in income generating livelihoods (non-fisheries related e.g. tourism) due to foreign commercial vessels	+																
Reduction in income generating livelihoods (fisheries related) due to unsustainable harvesting and destructive practices	+																
Reduction in future use value (bequest, intrinsic and existence value) of ecosystems	+																
Reduction in local biodiversity derivable benefits due to foreign commercial vessels	+																
Reduction in foreign earnings due to loss of biodiversity	+																
Reduction in real estate values																	
Decrease in value of catches as a result of "fishing down the food chain"	+																
Unpredictable household income due to unsustainable nature of fishery - 'boom and bust'	+																
Increased vulnerability decreased resilience.	+										+		+	+	+		+
Reduction in biomedical resources				+	+												+
Impacts upon traditional resource use patterns	+					<b>←</b>											
Livelihood impacts due to theft and vandalism	+					+											
Increased dependence on tourism due to a reduction in income generating fishery	+					+											

			PROV	ISIONI	NG SEF	RVICES					R	EGULA	TING S	ERVIC	ES		
	Pro01	Pro02	Pro03	Pro04	Pro05	Pro06	Pro07	Pro08	Reg01	Reg02	Reg03	Reg04	Reg05	Reg06	Reg07	Reg08	Reg09
Socio-economic Impacts	Food (e.g. fish, game fruit)	reshwater (e.g. for drinking, irrigation, cooling)	Raw materials (e.g. fibre, timber, fuel wood, fodder,	Genetic resources (e.g. for crop improvements and	Biochemical medicines and pharmaceuticals (e.g.	ital res	gical resources	Energy*	Air quality regulation (e.g. Capturing dust, chemicals,	Climate regulation (e.g. Carbon sequestration, influence of wegetation on rainfall atc.)	Natural hazard regulation (e.g. Storm protection and flood prevention)	Regulation of water flows (e.g. Natural drainage,	Naste treatment (especially water purification)	Erosion regulation / prevention	Nutrient cycling and maintenance of fertility (incl. soil	Pollination	Biological control (e.g. Seed dispersal, pest and disperse control)
Reduction in ornamental resources	+		<u>~</u> 4	. 0 6	8 4	<b>←</b>		ш	4 0	. O .=	<u> </u>	<u> </u>	>	ш	2 4	Ь	<u> </u>
Unpredictable household incomes	+																
Loss of cultural heritage																	
Increased unemployment	<b>←</b>					+											
Increased poverty	+					+											
Social conflicts	+					+											+
Conflicts between sectors (artisanal and industrial)	<del>-</del>																+
Loss of traditional management practices	+																
Loss of agricultural land	+																
Change in land-use and loss of critical habitats (e.g. mangrove)	+																
Pride - saltwater in the veins	+																
Increased (dependence on) mariculture	+																
Reduction in well-being	+										+	+	+	+	+		+

Table A3.5: Socio-Economic Impacts of Declines in Living Marine Resources -(Severity)

Socio-economic Impacts	1.	.2.	.3.	.4.	.1.	2.	.3.	.4.	.5.	1.	3.	4.	.5.	.6	7.		
	3.1.1.	3.1.2.	3.1.3.	3.1.4.	3.2.1.	3.2.2.	3.2.3.	3.2.4.	3.2.5.	3.3.1.	3.3.3.	3.3.4.	3.3.5.	3.3.6.	3.3.7.	3.4.	3.5.
	marine mammals	cetaceans	seabirds	turtles	sharks and rays	large pelagics	small pelagics	deep water demersals	reef and demersal fish	molluscs (bivalves, gastropods)	cephalopods	sea cucumbers	prawns and shrimp	lobsters	crabs	Excessive bycatch and discards	Expansion of mariculture
Increased malnutrition							4		4	3	2	1	4	1	1	4	
Reduction in food availability / security due to trophic cascades		1		1	2	2	3		4				1			3	
Reduction in food availability / security (local) due to local overexploitation				1	2	3	3	2	4	3	1	1	3	1	1	4	
Reduction in food availability / security (local) due to destructive / non-selective gear by local vessels					2	1	2	1	4	1			4			4	
Reduction in food availability / security (local) due to destructive / non-selective gear used by foreign industrial vessels				1	3	1	1	1	1				3			4	
Increased food prices for local community							4	2	4	3	1		3		1	3	
Increased operational costs for fishers							3	2	3	3	3	3	3	3	3	3	
Increased cost of living for local community							3	2	3	3	3	3	3	3	3	3	
Increased migration (people) leading to social issues							4		3	3	3	3	3	3	3	3	
Abuse of office by government officers					2	2			1	2	2	2	2	2	2	2	
Increased non-compliance (illegal fishing)					2	2		1	3	2		2	2	3	2	4	
Increased rent-seeking behaviour (bribery) by government officers					1	1			1	2		2	2	3	2	3	
Change in gear and increased use of destructive fishing practices			1					1	3				4			3	
Reduction in opportunities for recreation, tourism and leisure due to loss of biodiversity	1	2	1	1	3	3		1	3							2	
Reduction in aesthetics 'landscape/seascape' value of the natural environment	1	2	2	1	1	1			3	1		1		1		2	
Reduction in income generating livelihoods (non-fisheries related e.g. tourism) due to foreign commercial vessels	1	1		1	3	2			1							1	
Reduction in income generating livelihoods (fisheries related) due to unsustainable harvesting and destructive practices	1				3	2	2	2	4	2	2	2	2	2	2	2	
Reduction in future use value (bequest, intrinsic and existence value) of ecosystems	2	3	1	2	4	1	2	2	3	2	2	2	2	2	2	3	
Reduction in local biodiversity derivable benefits due to foreign commercial vessels	1	1		1	4	1		2					1			2	
Reduction in foreign earnings due to loss of biodiversity	1	2		1	2				3		2	2	2	2		2	
Reduction in real estate values																	
Decrease in value of catches as a result of "fishing down the food chain"					1		3		3							3	
	_	_				_			_					-			

Socio-economic Impacts	3.1.1.	3.1.2.	3.1.3.	3.1.4.	3.2.1.	3.2.2.	3.2.3.	3.2.4.	3.2.5.	3.3.1.	3.3.3.	3.3.4.	3.3.5.	3.3.6.	3.3.7.	3.4.	3.5.
	marine mammals	cetaceans	seabirds	turtles	sharks and rays	large pelagics	small pelagics	deep water demersals	reef and demersal fish	molluscs (bivalves, gastropods)	cephalopods	sea cucumbers	prawns and shrimp	lobsters	crabs	Excessive bycatch and discards	Expansion of mariculture
Unpredictable household income due to unsustainable nature of fishery - 'boom and bust'											2		2				
Increased vulnerability decreased resilience.				1	1	2		2	3	2	2	2	2	2	2	2	
Reduction in biomedical resources					2				1			1					
Impacts upon traditional resource use patterns	1	1		1	2	1	2	3	3	2	2	2	2	2	2	2	
Livelihood impacts due to theft and vandalism									3								
Increased dependence on tourism due to a reduction in income generating fishery						3	3	3	3				2			2	
Reduction in ornamental resources				1	1			1	1							1	
Unpredictable household incomes					1	2	3	3	3		2	2	2			2	
Loss of cultural heritage	1	1		2	1			3	3	2						2	
Increased unemployment	1	1		1	2	3	3	3	3	2	2	2	2	2	2	2	
Increased poverty	1	1		1	2	2	3	3	3	2	2	2	3	2	2	2	
Social conflicts	1	1		1	1	1	3	3	3			2	2			2	
Conflicts between sectors (artisanal and industrial)				2	2	3		3	3				3			3	
Loss of traditional management practices									3		1						
Loss of agricultural land																	
Change in land-use and loss of critical habitats (e.g. mangrove)										3			4	4			
Pride - saltwater in the veins								1	3								
Increased (dependence on) mariculture													3		2		
Reduction in well-being	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Table A3.6A: Stakeholders affected by Socio-Economic Impacts of Declines in Living Marine Resources

	Fishe	eries an	nd Aau	acultui	re		Agric	ulture	and Fo	restrv	,						
Socio-economic Impacts							7.8.10			,							
	Artisanal fishers	Industrial fishers	Recreational fishers	Seaweed farmers	Industrial prawn farmers	Fish & shellfish farmers	Charcoal makers	Small-scale loggers	Industrial loggers	Small-scale farmers	Large-scale farmers	Forest users/herbalists	Pastoralists	Ranchers	Poultry farmers	Dairy farmers	Beekeepers
Increased malnutrition																	
Reduction in food availability / security due to trophic cascades																	
Reduction in food availability / security (local) due to local overexploitation																	
Reduction in food availability / security (local) due to destructive / non-selective gear by local vessels																	
Reduction in food availability / security (local) due to destructive / non-selective gear used by foreign industrial vessels																	
Increased food prices for local community																	
Increased operational costs for fishers																	
Increased cost of living for local community																	
Increased migration (people) leading to social issues																	
Abuse of office by government officers																	
Increased non-compliance (illegal fishing)																	
Increased rent-seeking behaviour (bribery) by government officers																	
Change in gear and increased use of destructive fishing practices																	
Reduction in opportunities for recreation, tourism and leisure due to loss of biodiversity																	
Reduction in aesthetics 'landscape/seascape' value of the natural environment																	
Reduction in income generating livelihoods (non-fisheries related e.g. tourism) due to foreign commercial vessels																	
Reduction in income generating livelihoods (fisheries related) due to unsustainable harvesting and destructive practices																	
Reduction in future use value (bequest, intrinsic and existence value) of ecosystems																	
Reduction in local biodiversity derivable benefits due to foreign commercial vessels																	
Reduction in foreign earnings due to loss of biodiversity																	
Reduction in real estate values																	
Decrease in value of catches as a result of "fishing down the food chain"																	
Unpredictable household income due to unsustainable nature of fishery - 'boom and bust'																	
Increased vulnerability decreased resilience.																	
Reduction in biomedical resources																	
Impacts upon traditional resource use patterns																	
Livelihood impacts due to theft and vandalism																	

					STAK	EHOLD	ERS										
	Fishe	ries an	nd Aqu	acultur	re		Agric	ulture	and Fo	restry							
Socio-economic Impacts																	
					Ş												
			_		ndustrial prawn farmers	shellfish farmers						ists					
		S	Recreational fishers	S	ן far	farn	S	ers	rs	Small-scale farmers	Large-scale farmers	Forest users/herbalists					
	Artisanal fishers	ndustrial fishers	al fis	seaweed farmers	rawı	fish	Charcoal makers	Small-scale loggers	Industrial loggers	farn	farn	s/he			Poultry farmers	rs	
	al fis	al fi	iona	d fa	al p	hell	Ë	ale	allo	ale	cale	ıser	lists	S	farn	Dairy farmers	Beekeepers
	sana	ıstri	reat	wee	ıstri	∞	rcog	)-Sc	ıstri	OS-III	e-s	est u	ora	chei	ltry	y fa	keel
	Arti	npul	Reci	Sea	Indu	Fish	Cha	Sma	ηρυΙ	Sma	Larg	Fore	Pastoralists	Ranchers	Pou	Dair	Bee
Increased dependence on tourism due to a reduction in income generating fishery																	
Reduction in ornamental resources																	
Unpredictable household incomes																	
Loss of cultural heritage																	
Increased unemployment																	
Increased poverty																	
Social conflicts																	
Conflicts between sectors (artisanal and industrial)																	
Loss of traditional management practices																	
Loss of agricultural land																	
Change in land-use and loss of critical habitats (e.g. mangrove)																	
Pride - saltwater in the veins																	
Increased (dependence on) mariculture																	
Reduction in well-being																	

Table A3.6B: Stakeholders affected by Socio-Economic Impacts Declines in Living Marine Resources

	STA	KEHOLE	DERS														
	Indus	stry			Tran	nsportat	tion						Energ	gy Produ	uction	Urbai	nisatio
Socio-economic Impacts	Heavy manufacturing industry	Light manufacturing industry	Agro-processing industries	Oil refining	Ports	Dredging companies	Clearing and forwarding	Railway	Roads (incl. traffic)	Airports	Airlines	Shipping	Hydro-dam operators	Power station operators	Renewable energy producers	Solid waste operators	Sewage managers
Increased malnutrition												-					 
Reduction in food availability / security due to trophic cascades	'	<u></u>			'	'											
Reduction in food availability / security (local) due to local overexploitation	<u> </u>				<u> </u>	<u> </u>		<u> </u>	<u> </u>								<u> </u>
Reduction in food availability / security (local) due to destructive / non-selective gear by local vessels	<u> </u>				<u> </u>	<u> </u>		<u> </u>	<u> </u>				<u> </u>				<b></b>
Reduction in food availability / security (local) due to destructive / non-selective gear used by foreign industrial vessels	<u> </u>				<u> </u>	<u> </u>		<u> </u>	<u> </u>				<u> </u>				<u> </u>
Increased food prices for local community	<u> </u>				'	<u> </u>		'	<u> </u>								<u> </u>
Increased operational costs for fishers	<u> </u>				'	<u> </u>		'	<u> </u>								<u> </u>
Increased cost of living for local community	<u> </u>				'	<u> </u>		'	<u> </u>								<u> </u>
Increased migration (people) leading to social issues	<u></u> '				'	'			'								<u> </u>
Abuse of office by government officers	<u> </u>				'	<u> </u>											<u> </u>
Increased non-compliance (illegal fishing)	<u> </u>				'	<u> </u>											<u> </u>
Increased rent-seeking behaviour (bribery) by government officers	<u> </u>				<u> </u>	'		'									<u> </u>
Change in gear and increased use of destructive fishing practices	<u> </u>				'	<u> </u>		'	<u> </u>								<u> </u>
Reduction in opportunities for recreation, tourism and leisure due to loss of biodiversity	<u> </u>				<u> </u>	<u> </u>		<u> </u>	<u> </u>								<u> </u>
Reduction in aesthetics 'landscape/seascape' value of the natural environment	'				'												
Reduction in income generating livelihoods (non-fisheries related e.g. tourism) due to foreign commercial vessels	'				'				'								ı

	STAP	KEHOLE	DERS														
	Indus	stry			Trans	sportat	ion						Energ	y Produ	uction	Urbai	nisatio
Socio-economic Impacts	Heavy manufacturing industry	Light manufacturing industry	Agro-processing industries	Oil refining	Ports	Dredging companies	Clearing and forwarding	Railway	Roads (incl. traffic)	Airports	Airlines	Shipping	Hydro-dam operators	Power station operators	Renewable energy producers	Solid waste operators	Sewage managers
Reduction in income generating livelihoods (fisheries related) due to unsustainable harvesting and destructive practices																	1
Reduction in future use value (bequest, intrinsic and existence value) of ecosystems																	
Reduction in local biodiversity derivable benefits due to foreign commercial vessels									_				_	_			
Reduction in foreign earnings due to loss of biodiversity																	
Reduction in real estate values																	<u> </u>
Decrease in value of catches as a result of "fishing down the food chain"																	Щ.
Unpredictable household income due to unsustainable nature of fishery - 'boom and bust'																	<u> </u>
Increased vulnerability decreased resilience.																	<u></u>
Reduction in biomedical resources																	<u></u>
Impacts upon traditional resource use patterns																	<u> </u>
Livelihood impacts due to theft and vandalism																	
Increased dependence on tourism due to a reduction in income generating fishery																	<u> </u>
Reduction in ornamental resources																	
Unpredictable household incomes																	<u></u>
Loss of cultural heritage																	<u></u>
Increased unemployment																	<u> </u>
Increased poverty																	<u> </u>

	STAK	EHOLI	DERS														
	Indus	stry			Tran	sportat	ion						Energ	y Prodi	uction	Urba	nisatio
Socio-economic Impacts	Heavy manufacturing industry	Light manufacturing industry	Agro-processing industries	Oil refining	Ports	Dredging companies	Clearing and forwarding	Railway	Roads (incl. traffic)	Airports	Airlines	Shipping	Hydro-dam operators	Power station operators	Renewable energy producers	Solid waste operators	Sewage managers
Social conflicts																	
Conflicts between sectors (artisanal and industrial)																	
Loss of traditional management practices																	
Loss of agricultural land																	
Change in land-use and loss of critical habitats (e.g. mangrove)																	
Pride - saltwater in the veins																	
Increased (dependence on) mariculture																	

Table A3.7A: Direct Causes of Declines in Living Marine Resources - Contribution

Direct Causes	3.1.1	3.1.2	3.1.3	3.1.4	3.2.1	3.2.2	3.2.3	3.2.4	3.2.5.	.3.1.	3.3.2	3.3.3	.3.4	3.3.5	3.3.6	3.4.	3.5.	
	marine 3 mammals	cetaceans	seabirds	3turtles	sharks and <b>3</b> rays	large pelagics	small 3	deep water <b>3</b> demersals	reef and demersal fish	molluscs 3.	cephalods 3	sea 3	prawns and <b>3.3.4</b> shrimp	lobsters 3	crabs 3	Excessive 3 bycatch and	Expansion of <b>3</b> mariculture	Contribution
Accidental capture / bycatch	4	4	2	4	4		2		3									23
Unsustainable harvesting		1		3	4	3	2	2	4	4	4	4	4	4	2		1	44
Poaching / illegal fishing	2	2		4	3	3	1	1	2	3		4		3			2	34
Illegal , Unregulated and Unreported fishing	2	2		4	3	3	1	1	1	3		4		3			2	33
Overexploitation / overfishing					4	3	2	2	4	4	4	4	4	4	2		1	40
Recruitment overfishing					3	4	2	2	4	4	1	3	2	2				31
Destructive fishing methods							2		4		4							10
Navigational hazards / collisions	3	4																7
Killing of animals and eggs			3	3														6
Changes in ocean circulation and seawater temperature	2	2	2	2	2	3	3		2	2	2	1	1	2	2		2	32
Physical habitat damage, degradation and loss	3		2	4					4	2		3	3	1	2			26
Disturbance of nests (birds and turtles)			3	4														7
Damage to nursery habitats			3	3	3				4			2	2					19
Noise disturbance	4	4		2														10
Ocean acidification									2	2			2	2	2		2	14
Coral bleaching									4									4
Sea level rise			2	2													2	6
Poor water quality				1					3	2			2				2	10
Sedimentation									4	2							2	8
Alteration of river flows, changes in salinity and freshwater inflows					2		1		4				4		2		2	15
Decline in fisheries (food supply)		1	2	2	2												4	11
Unemployment				2	2		2		4								4	14
TOTAL	20	20	19	40	32	19	18	8	53	28	15	25	24	21	12	0	26	

Table A3.7B: Direct Causes of Declines in Living Marine Resources - Irreversibility

					<del>-</del>											1	$\overline{}$	
	3.1.1	3.1.2	3.1.3	3.1.4	3.2.1	3.2.2	3.2.3	3.2.4	3.2.5	3.3.1.	3.3.2.	3.3.3	3.3.4	3.3.5	3.3.6	3.4.	3.5.	
Direct Causes	marine mammals	cetaceans	seabirds	turtles	sharks and rays	large pelagics	small pelagics	deep water demersals	reef and demersal fish	molluscs (bivalves, gastropods)	cephalods	sea cucumbers	prawns and shrimp	lobsters	crabs	Excessive bycatch and discards	industry (biosecurity, diseases in wildstocks, exotics. habitat	Irreversibility
Accidental capture / bycatch	3	3	2	2	1		2		3									16
Unsustainable harvesting		2			3	2	2	2	4	3	2	2	2	2	2		1	29
Poaching / illegal fishing		3		3	3	3	1	4	4	3	2	3		3			1	33
Illegal , Unregulated and Unreported fishing		3		3	3	3	1	4		3		3		3			1	27
Overexploitation / overfishing					1	2	2	2	4	3	2	2	2	2	2		1	25
Recruitment overfishing					3	3	2	3	3	3	3	3	3	3				29
Destructive fishing methods							3		4		3							10
Navigational hazards / collisions	4	4																8
Killing of animals and eggs			3	3														6
Changes in ocean circulation and seawater temperature	4	4	4	4	4	4	4		4	4	4	4	4	4	4		4	60
Physical habitat damage, degradation and loss	2		2	2					3	3		3	3	3	3			24
Disturbance of nests (birds and turtles)			2	2														4
Damage to nursery habitats			2	2	2				4			3	3					16
Noise disturbance	2	2		2														6
Ocean acidification									4	4		4	4	4			4	24
Coral bleaching									4									4
Sea level rise			4	4													3	11
Poor water quality				2					2	2			4				3	13
Sedimentation									3	3							3	9
Alteration of river flows, changes in salinity and freshwater inflows					3		3		3				4		4		4	21
Decline in fisheries (food supply)		2	2	2	2												3	11
Unemployment				4	4		4										4	16
TOTAL	15	23	21	35	29	17	24	15	49	31	16	27	29	24	15	0	32	

Table A3.8 : Direct causes and Sectors contributing towards Declines in Living Marine Resources

	Urbanisation	Tourism	Agriculture & Forestry	Industry	Transportation & Shipping	Mining	Fisheries (industrial / commercial)	Fisheries (semi-industrial - local)	Fisheries (artisanal / traditional)	Fisheries (small scale)	Fisheries (inshore trawl fishery	Fisheries (recreational)	Fisheries (sports)	Fisheries (poaching /	Fisheries (mariculture)	Energy	Environmental	TOTAL (no. sectors
Accidental capture / bycatch							Υ	Υ	Υ	Υ	Υ							5
Unsustainable harvesting							Υ	Υ	Υ	Υ	Υ	Υ	Υ		Υ			8
Poaching / illegal fishing							Υ	Υ	Υ	Υ	Υ	Υ	Υ		Υ			8
Illegal , Unregulated and Unreported fishing							Υ	Υ	Υ	Υ	Υ	Υ	Υ		Υ			8
Overexploitation / overfishing							Υ	Υ	Υ	Υ	Υ	Υ	Υ					7
Recruitment overfishing							Υ	Υ	Υ	Υ	Υ	Υ	Υ					7
Destructive fishing methods							Υ	Υ	Υ	Υ	Υ							5
Navigational hazards / collisions					Υ													1
Killing of animals and eggs									Υ	Υ								2
Changes in ocean circulation and seawater temperature																Υ	Υ	2
Physical habitat damage, degradation and loss	Υ	Υ	Υ	Υ		Υ	Υ	Υ	Υ	Υ	Υ				Υ	Υ	Υ	13
Disturbance of nests (seabirds and turtles)	Υ	Υ				Υ			Υ	Υ								5
Damage to nursery habitats	Υ	Υ	Υ	Υ		Υ	Υ	Υ	Υ	Υ	Υ				Υ	Υ	Υ	13
Noise disturbance	Υ	Υ			Υ	Υ	Υ	Υ			Υ							7
Ocean acidification																	Υ	1
Coral bleaching																	Υ	1
Sea level rise																	Υ	1
Poor water quality	Υ	Υ	Υ	Υ	Υ	Υ									Υ			7
Sedimentation	Υ	Υ	Υ	Υ		Υ												5
Alteration of river flows, changes in salinity and freshwater inflows	Υ	Υ	Υ			Υ											Υ	5
Decline in fisheries (food supply)							Υ	Υ	Υ	Υ	Υ	Υ	Υ		Υ			8
Unemployment																		0
TOTAL (No. causes)	7	7	5	4	3	7	11	11	12	12	11	6	6	0	7	3	7	

Table A3.9: Sectors, Resource Use Practices, Underlying and Root Causes

Fisheries & Aquaculture	3.2.2																		(4) Finning and dumping						(3) Shark finning		(tuna longliners)	(2) Accidental capture		(1) Overfishing	Fisheries & Aquaculture	3.2.1	Sector and Underlying Resource Use Practice	
																			<u>a</u>						ing		rs)	capture		04			source	
	Declines in population of large pelagics	Government fear that higher levies will increase unemployment	Source of foreign revenue	Treasury not willing to increase levies -	Funding model based of levies - which are insufficient	No more funds available as insufficient tax revenues to cover social relief	model allows	ranura in local concanon system	Difficulty attracting scientists	Shortage of trained scientists	Lack of political understanding of need for R&D	Inadequate funds for research	Corruption	Inadequate enforcement of regulations	Limits and regulations poorly defined	Limits and regulations in place	Greed	Price of fins much higher (storage)	International market demand for fins not bodies	Conflicting decision making framework	Political / financial need to allow foreign fleets to fish	Irresponsible fishing practices	Inadequate data / monitoring	Price of fins much higher (storage)	International market demand for fins	Inadequate enforcement of regulations	Inappropriate regulation (don't know life cycle)	No means of monitoring, control or surveillance	Cultural / traditional consumption of shark fin soup	External market demand		Declines in population of sharks and rays	Underlying Social, Economic, Legal and Political Causes	
		<b>↑</b>						1					<b>^</b>	<b>^</b>						<b>↑</b>	<b>↑</b>	<b>^</b>				<b>1</b>		<b>1</b>					[A]Inappropriate governance	
			<b>→</b>	<b>1</b>					<b>↑</b>				<b>→</b>			<b>→</b>	<b>→</b>	<b>1</b>	<b>↑</b>		<b>1</b>			<b>→</b>	<b>→</b>				<b>↑</b>	<b>1</b>			[B] Economic drivers	
		<b>↑</b>		1	1	<b>↑</b>	1			1		<b>1</b>											<b>1</b>					<b>↑</b>					[C] Inadequate financial resources	
								1	<b>\</b>	1	1	<b>^</b>			<b>^</b>							<b>^</b>	<b>^</b>				<b>1</b>						[D] Inadequate knowledge & awareness	
									<b>↑</b>																				<b>1</b>				[E] Cultural traditions	Root Causes
																													<b>1</b>				[F] Population pressure & demographics	auses
		<b>↑</b>				<b>↑</b>																											[G] Poverty & inequality	
																																	[H] Climate change & natural processes	
																																	[I] Voluntary action fills the	
		-				-			<b>1</b>				<b>1</b>			<b>1</b>	<b>↑</b>	<b>1</b>	<b>1</b>			<b>^</b>		<b>^</b>	<b>^</b>								[J] Personal Attitude	

(1) Expansion of small	Fisheries & Aquaculture	3.2.3	Reduced primary production	Natural environmental variability and change					ā	(7) Tourist sports	Tourism			tunas	gill nets catch juvenile	(6) Recruitment		(5) Overcapacity		(innovations)	(4) Fishing techniques							(3) Illegal, unregulated and unreported in EEZ		(2) Drifting FADs	(1) Non selective gear	Overfishing of large	Sector and Underlying Resource Use Practice	
Local market demand for seafood		Declines in population of small pelagics			No regulation or control over fishery	Inadequate or lack of monitoring or management of recreational and sports fishery (e.g. permitted under different ministry)	Inward migration from other countries (e.g. France and elsewhere) to set up businesses	Increasing number of fishers becoming skippers	Decline in fisheries catches and increased unemployment	Increasing demand for sports fishing activities		Lack of education and training	No alternative livelihood for sustainable livelihood	Other priorities	No monitoring, control or surveillance capacity	Scientific recommendations not considered	No management of catches	Government lacks alternative means of generating revenues	Conflicting decision making framework	Political / financial need to allow foreign fleets to fish	External market demand	Inadequate monitoring, control and surveillance	Inadequate resources (no patrol vessels)	Limited management of fishery	Overcapacity in fishery	Local market demand	Lack of regulations	External market demand	Fishing licences source of revenue for Government	No catch quotas or limits	Loss of jobs - unemployment		Underlying Social, Economic, Legal and Political Causes	
					<b>1</b>	<b>↑</b>	<b></b>							<b>^</b>	<b>^</b>	<b>^</b>	<b>^</b>		<b>1</b>	<b>^</b>		<b>^</b>		<b>1</b>	<b>1</b>		<b>1</b>			<b>↑</b>			[A]Inappropriate governance	
1							<b>^</b>	<b>1</b>		<b>1</b>				<b>←</b>				<b>1</b>		<b>1</b>	<b>^</b>			<b>1</b>	<b>1</b>	<b>1</b>		<b>1</b>	<b>1</b>		<b>1</b>	<b>←</b>	[B] Economic drivers	
					<b>1</b>	<b>→</b>											<b>↑</b>	<b>1</b>				<b>→</b>	<b>→</b>	<b>↑</b>									[C] Inadequate financial resources	
						<b>↑</b>						<b>→</b>					<b>1</b>													<b>→</b>			[D] Inadequate knowledge &	
																																	[E] Cultural traditions	Root (
1								<b>1</b>					<b>1</b>															<b>1</b>			<b>1</b>	<b>1</b>	[F] Population pressure & demographics	Root Causes
<b>1</b>								<b>^</b>	<b>↑</b>				<b>^</b>																		<b>↑</b>		[G] Poverty & inequality	
			1																														[H] Climate change & natural	
																																	[I] Voluntary action fills the	
																																	[J] Personal Attitude	

						Root Causes	auses				
		ance		resources	ge &		&		tural	the	
		ate governar	drivers	e financial re	te knowledge	aditions	n pressure &	inequality	nange & natu	action fills th	Attitude
Sector and Underlying Resource		]Inappropri	] Economic	] Inadequat	] Inadequat vareness	Cultural tra	Population	] Poverty &	] Climate ch	Voluntary a	Personal A
pelagic fisheries	Removal of large pelagics so no choice	[/	<b>1</b>	[0		[E		<b>1</b>		- 1	[]
	Cheaper food fish for local consumption						<b>1</b>	1			
	Change in distribution pattern of other species						<b>↑</b>	1	1		
	Accessible species						<b>1</b>	<b>1</b>			
	Money making livelihood						<b>1</b>	<b>1</b>			
	Lack of regulations	<b>^</b>									
	Lack of monitoring control and surveillance	<b>1</b>		<b>1</b>							
	Lack of knowledge of sustainability principles				<b>1</b>						
Environmental											
Freshwater input									1		
Seawater temperature									1		
Nutrients									1		
Shifts in primary and secondary production									<b>↑</b>		
3.2.5	Declines in population of reef and demersal fish										
Aquaculture											
(1) Overexploitation of	International market demand for ornamental species	<b>^</b>	<b>1</b>					<b>1</b>			
ornamental species	(see chain on coral reefs for further details)	<b>↑</b>						<b>1</b>			
(2) Destructive fishing	Market demand for reef fish species		<b>^</b>				<b>1</b>	1			
methods	Preference for reef fish										<b>1</b>
	Migration to coast		<b>1</b>				1	<b>1</b>			ı
	Decline in stocks increased use of destructive / illegal methods	<b>1</b>					<b>1</b>	1			
	Lack of compliance with regulations	<b>^</b>					1	1			
	Inadequate awareness and knowledge				<b>1</b>						
	Rent-seeking behaviour (bribery)	<b>^</b>	<b>^</b>					<b>1</b>			
	Conflicts between resource users	<b>1</b>						<b>1</b>			
	Lack of monitoring control and surveillance	<b>^</b>		<b>1</b>							
	Lack of data on species				<b>1</b>						
	Lack of fisheries management	<b>↑</b>			<b>1</b>						
	Weak enforcement	<b>1</b>		<b>1</b>							
(3) Non-selective gear	Market demand for reef fish species		<b>^</b>				<b>1</b>				
	Preference for reef fish										<b>1</b>
	Lack of compliance with regulations	<b>1</b>					<b>^</b>	<b>1</b>			
	Lack of data on species				1						
	Inadequate awareness and knowledge				1						
	Lack of monitoring control and surveillance	1		<b>1</b>							1
			ĺ								

(11) Poor disposal of Rural poverty driving people to the coast / Migration to	(10) Unplanned Inappropriate development in estuaries and near the settlements / mouth	Opportunistic cardias are profitable	1	•	If catches are low in trawls will target line fish	fishery  Trawl fishery grounds overlap	(9) Opportunistic Inadequate management system and compliance	they of recilians by to around by content	r-catch	(8) By-catch from Trawl fishery grounds overlap	Political pressure for continued access		No enforcement	No management plan	Money making livelihood (small-scale / artisanal)		(iv) poachers /illegal	/ small-	reational fishers Continued fishing of heavily depleted stocks	Green	overfishing by:  Culture of entitlement and blame shifting  Culture of entitlement and blame shifting	(7) Recruitment Overcapacity (commercial)	No enforcement	(iv) poachers / illegal No management plan	(iii) industrial fishers Overcapacity	(ii) semi-industrial Open access fishery	Scale fishers  Lack of alternative livelihood	(6) Overfishing by: Market demand for reef fish species	Lack of alternatives	Open access resource	Preference for reef fish	(5) Overcapacity Money making livelihood	Lack of fisheries management	Lack of monitoring control and surveillance	rol and consoillance	Preference for reef fish	(4) Illegal fishing Market demand for reef fish species	Weak enforcement	Underlying Social, Economic, Legal and Political Causes A B C D A	Resource Ecc	ppropriate gov onomic drivers dequate finan- adequate knowness ltural traditions
<b>1</b>											<b>^</b>	•													<b>↑</b>	<b>↑</b>	<b>^</b>	<b>^</b>		<b>^</b>		<b>^</b>					<b>↑</b>		[E] [F]	Cultu Popu	ıral tradition: lation pressu
	•										<b>↑</b>					<b>↑</b>									<u>+</u>	<u>+</u>	<u>+</u>	<u>•</u>		<b>↑</b>		<b>↑</b>				-	<u>+</u>		[G] [H]	Clima	rty & inequa
																			1	N	<b>↑</b>									<b>↑</b>	<b>↑</b>				1	•			[I]	err	ses untary action f nance void sonal Attitude

Sector and Underlying Social, Economic, Legal and Political Causes Underlying Social, Economic, Inc. Causes Underlying Social, Economic, Legal and Political Causes Underlying Social Economics Underlying Social Economics Underlying Social Economics Underlying Social Economics Underlying Increased Underlying Social Economics Underlying Increased Underlying Social Economics Underlying Increased Underlying Increased Underlying Increased Economics Infections Social Economics Underlying Increased Und							Root Causes	auses			
Regional instability  Regional metable / expensive  Regional instability  Regional instability  Regional instability  Regional instability  Regional metable / expensive  Regional instability  Regional instability  Regional metable / expensive  Regional instability  Regional metable / expensive  Regional metable / expensive  Regional instability  Regional metable / expensive  Regional metable /	Sector and Jnderlying Resource Use Practice	Underlying Social, Economic, Legal and Political Causes	[A]Inappropriate governance	[B] Economic drivers	[C] Inadequate financial resources		[E] Cultural traditions		[G] Poverty & inequality		[I] Voluntary action fills the
Regional instability Increased unplanned developments Poor strategic planning Outdated wastewalter infrastructure Poor inplementation of IcaM plan Regional instability Poor implementation of ICAM plan Regional fishing by Icade of awareness and knowledge Railure to cost environment Rayansion of the tourism sector Rayansion of alternative / expensive Rayansion of agricultural sector Rayansion of agricultural s	soakaways, septic	Illegal immigration to country	[	<b>1</b>	[	- 1-	[		<b>1</b>	- 1-	[
Increased unplanned developments	anks)	Regional instability	<b>↑</b>								
Poor strategic planning  Outdated wastewater infrastructure  Poor implementation of ICZM plan  Fallure to cost environment  CZM plan not implemented  Fallure to cost environment  CZM plan not implemented  Fallure to protect watershed  Fallure		Increased unplanned developments	1	1				<b>↑</b>	1		
Outdated wastewater infrastructure  Poor implementation of ICZM plan  reational sol (Tampling Expansion of the tourism sector reational sol (Tampling Expansion of the tourism sector  Inack of awareness and knowledge  Aark of awareness and knowledge  Aark of investment and maintenance of sewage  aster		Danu stratonic planning	,	•				•	•	╽	
Couracted wastewater infrastructure  Poor implementation of ICZM plan struction of mouth Inappropriate development in estuaries and near the Expansion of the tourism sector Far sports For including Lack of awareness and knowledge For ardisposal of Lack of infrastructure  aster Tays, septic Target in the control and maintenance of sewage Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Tays, septic Target in the control and enforcement / Infristructrure Tays, septic Tays, se		Poor strategic planning	1								
Failure to cost environment  Failure to cost environment in estuaries and near the month  Failure to cost environment in estuaries and near the cost environment  Failure to cost environment in estuaries and near the cost environment  Failure to cost environment  Failure to cost environment  Failure to cost environment  Failure to cost environment  Market demand for building materials  Failure to cost environment  Failure to cost environment  Market demand for sand and minerals  Failure to cost environment  Control and enforcement  Control and enforcement  Failure to cost environment  Control and enforcement  Failure to cost environment  Control and enforcement  Failure to cost environment  Control and enforcement  Control and enforcement  Failure to cost environment  Control and enforcement		Outdated wastewater infrastructure	<b>1</b>		<b>^</b>						
Failure to cost environment  Authority  Inappropriate development in estuaries and near the mappropriate development in estuaries and near the mouth  Expansion of the tourism sector  10 Trampling to CZM plan not implemented  20 Fash fishing by conaid livers in CZM plan not implemented  21 Fash fishing by conaid livers  22 Fash fishing by conaid livers  23 Fash fishing by conaid livers  24 Fash fishing by conaid livers  25 Fash fishing by conaid livers  26 Fash fishing by conaid livers  27 Fash fishing by conaid livers  28 Fash fishing by conaid livers  29 Fash fishing by conaid livers  20 Fash fishing by conaid livers  28 Fash fishing by conaid livers  29 Fash fishing by conaid livers  20 Fash fishing by conaid livers  21 Fash fishing by conaid livers  22 Fash fishing by conaid livers  23 Fash fishing by conaid livers  24 Fash fishing by conaid livers  25 Fash fishing by conaid livers  26 Fash fishing by conaid livers  27 Fash fishing by conaid livers  28 Fash fishing by conaid livers  28 Fash fishing by conaid livers  29 Fash fishing by conaid livers  20 Fash fishing by conaid livers  21 Fash fishing by conaid livers  22 Fash fishing by conaid livers  23 Fash fishing by conaid livers  24 Fash fishing by conaid		Poor implementation of ICZM plan	<b>↑</b>								
Infanction of mappropriate development in estuaries and near the mouth mouth mouth mouth mouth mouth mouth mouth mouth services and formation of the tourism sector  (i) I Tampling Expansion of the tourism sector  (ii) I Tampling Expansion of the tourism sector  (iii) I Tampling Expansion of the tourism sector  (iii) I Tampling Expansion of the tourism sector  (iii) I Tampling Expansion of inplemented  (iii) I Tampling by Market demand  (iii) I Tampling by Market demand mouth mouth maintenance of sewage  (iii) I Tampling I Taket of investment and maintenance of sewage  (iii) I Tampling I Taket demand I Tamplement I Infrastructrure  (iii) I Tampling I Tamplement I Infrastructrure  (iii) I Tamplement I Tamplement I Infrastructrure  (iii) I Tamplement I Tamplement I Infrastructrure  (iii) I Tamplement I Infrastructrure  (iii) I Tamplement I Infrastructrure  (iii) I Tamplement I Tamplement I Infrastructrure  (iii) I Tamplement I Infra		Failure to cost environment	<b>1</b>	<b>1</b>		<b>1</b>					
inappropriate development in estuaries and near the mouth fromes (i) Trampling (ii) Trampling (iii) Trampling	<b>Tourism</b>										
reational styl Transpling Lack of awareness and knowledge re raports (IZM plan not implemented	(12) Construction of noliday homes	Inappropriate development in estuaries and near the mouth		<b>↑</b>				<b>↑</b>			
t anchors t anch	(13) Recreational	Expansion of the tourism sector	<b>↑</b>	<b>1</b>		<b>1</b>					
CZM plan not implemented	activities (i) Trampling ii) Water sports	Lack of awareness and knowledge				1					
gal fishing by Joe Balthing Balth	iv) Boat anchors	ICZM plan not implemented	<b>1</b>			<b>1</b>					
Ack of enforcement    Carry   Carry	(14) Illegal fishing by	Market demand	<b>↑</b>	<b>^</b>		1					
rdisposal of infrastructure  Poor implementation of ICZM plan  Failure to cost environment  Migration to coast  Demand for building materials  Lack of alternative / expensive  In building  Expansion of agricultural sector  sof agric- sof agric- sof aurale  Poor land planning  Poor land planning  Poor land planning  Poor knowledge of farming  Lack of extension officers  Oduction of  To push of extension officers  Comparison  Poor knowledge of farming  Lack of extension officers  Comparison  Comparison  Poor land planning  Lack of extension officers  Comparison  Poor land planning  Lack of extension officers  Comparison  Comparison  Poor land planning  Lack of extension officers  Comparison  Poor land planning  Lack of extension officers  Comparison  Com	ecreational divers tourists) (e.g. Spearfishing)	Lack of enforcement	1		<b>↑</b>	<b>1</b>	<b>1</b>				
Poor municipal management / infristructrure Poor implementation of ICZM plan Failure to cost environment  Migration to coast Demand for building materials Lack of alternative / expensive Lack of control and enforcement  Market demand for sand and minerals Sincrease Sincrease Sincrease Tailure to protect watershed Water Act not enforced Poor land use practices Failure to protect watershed Foor land planning Poor land planning CZM plan not implemented Poor knowledge of farming Lack of extension officers  CZM plan conficers  CZM plan conficers	( <b>15)</b> Poor disposal of water waster	Lack of investment and maintenance of sewage infrastructure			<b>↑</b>						
Poor implementation of ICZM plan  Failure to cost environment  Migration to coast  Demand for building materials  Lack of alternative / expensive  Lack of alternative / expensive  Tack of control and enforcement  Market demand for sand and minerals  Lack of control and enforcement  Market demand for sand and minerals  Failure to protect watershed  Poor land use practices  Failure to protect watershed  Poor land planning  Poor land planning  CZM plan not implemented  Poor knowledge of farming  CZM plan of implemented  Poor knowledge of farming  CZM plan of implemented  Poor knowledge of farming  CZM plan of implemented  Poor knowledge of farming  Ack of extension officers  Ack of extension officers  Ack of extension officers  Ack of extension of implemented  Ack of extension officers  Ack of extension of implemented  Ack of extension officers  Ack of extension of implemented  Ack of extension officers  Ack of extension of implemented  Ack of extension officers  Ack of extension of implemented  Ack of extensio	soakaways, septic	Poor municipal management / infrstructrure	<b>1</b>								
Failure to cost environment  All mining for Migration to coast  Demand for building materials  Lack of alternative / expensive  Lack of alternative / expensive  Lack of control and enforcement  Expansion of agricultural sector  Todiuse  Todiuse  Poor land use practices  Failure to protect watershed  Todiuse  Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  Coduction of the protect watershed  Coduction of t	.dIIKS)	Poor implementation of ICZM plan	<b>1</b>								
ral mining for Migration to coast  Demand for building materials  Lack of alternative / expensive  Lack of control and enforcement  Market demand for sand and minerals  Lack of control and enforcement  Market demand for sand and minerals  Lack of control and enforcement  Market demand for sand and minerals  Expansion of agricultural sector  Water Act not enforced  Poor land use practices  Icrops  Failure to protect watershed  Poor land planning  CZM plan not implemented  Poor knowledge of farming  Lack of extension officers  CAL Carolitics  Action and  Poor knowledge of farming  Lack of extension officers  Action and  Action and  Poor knowledge of farming  Lack of extension officers  Action and  Action an		Failure to cost environment		<b>^</b>							
Coral mining for Const Migration to coast Command for building materials Command for building materials Construction of Introduction of Introd	Vining										
Demand for building materials  Lack of alternative / expensive  Mining in Market demand for sand and minerals  cultural & Lack of control and enforcement  stry  Dam building Expansion of agricultural sector  Use of agric- mical  Land-use mentation and ce water quality.  Low productivity, Poor land planning ICZM plan not implemented  Low production of introduction of larding steed crops Introduction of Introduction of larding steed steeds of extension officers  Action of services of larding materials  Action of alternative / expensive  Action of larding materials  Action of larding material	(16) Coral mining for	Migration to coast		<b>1</b>				<b>1</b>	<b>1</b>		
Lack of alternative / expensive  Market demand for sand and minerals  Lack of control and enforcement  Expansion of agricultural sector  Expansion of agricultural sector  Poor land use practices  Failure to protect watershed  Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  CHACLE ACT IN CONTROL IN	ime	Demand for building materials		<b>1</b>							
Market demand for sand and minerals  Lack of control and enforcement  Expansion of agricultural sector  Water Act not enforced  Poor land use practices Failure to protect watershed  Poor land planning ICZM plan not implemented  Poor knowledge of farming Lack of extension officers  A A A A A A A A A A A A A A A A A A A		Lack of alternative / expensive							<b>1</b>		
Expansion of agricultural sector  Expansion of agricultural sector  Water Act not enforced  Poor land use practices  Failure to protect watershed  Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  A A A A A A A A A A A A A A A A A A A	(17) Mining in	Market demand for sand and minerals		<b>1</b>							
Expansion of agricultural sector  Water Act not enforced  Poor land use practices Failure to protect watershed  Poor land planning ICZM plan not implemented  CA  CA  CA  CA  CA  CA  CA  CA  CA  C	estuaries	Lack of control and enforcement	<b>1</b>								
Expansion of agricultural sector  Water Act not enforced  Poor land use practices  Failure to protect watershed  Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  A A A A A A A A A A A A A A A A A A A	Agricultural & Forestrv										
Water Act not enforced  Poor land use practices  Failure to protect watershed  Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  A  A  A  A	(18) Dam building	Expansion of agricultural sector		1				<b>1</b>			
Poor land use practices  Failure to protect watershed  Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  A  A	( <b>19)</b> Use of agric- chemical	Water Act not enforced	<b>1</b>								
Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  A	( <b>20)</b> Land-use	Poor land use practices	<b>↑</b>					<b>1</b>	<b>1</b>		
Poor land planning  ICZM plan not implemented  Poor knowledge of farming  Lack of extension officers  A	oractices increase sedimentation and	Failure to protect watershed	<b>1</b>								
Poor knowledge of farming  Lack of extension officers  A	educe water quality.	Poor land planning	<b>1</b>								
Lack of extension officers  A		ICZM plan not implemented	<b>1</b>		<b>1</b>	<b>1</b>					
Lack of extension officers	(21) Low productivity,	Poor knowledge of farming				1					
of .	adapted crops	Lack of extension officers	<b>1</b>		<b>^</b>						
	(22) Introduction of non-native species of		<b>↑</b>								

			<b>↑</b>	<b>↑</b>		<b>↑</b>	No means of control	
<b>↑</b>	<b>1</b>		<b>^</b>		<b>1</b>	<b>↑</b>	Money making potential	(3) Dangerous (diving)
			<b>↑</b>		<b>↑</b>	<b>1</b>	Drugs used to improve catches	
			<b>↑</b>		<b>^</b>	<b>↑</b>	Money from sea cucumbers used to purchase drugs	
			<b>1</b>		<b>1</b>		Self-funding drug dependent culture	
				<b>↑</b>		<b>↑</b>	No means of control	
<b>↑</b>	<b>↑</b>		<b>1</b>		<b>↑</b>		Lack of alternative income generating livelihoods for fishers	
<b>↑</b>	<b>↑</b>				<b>^</b>		Unemployment and poverty in fisheries sector due to the reduction in catches	
					<b>1</b>		Internal restaurant trade (Chinese)	
					<b>1</b>		External market demand (Chinese)	(2) Illegal fishing
						<b>↑</b>	Inadequate surveillance and enforcement	
		<b>1</b>	<b>1</b>	<b>^</b>		<b>1</b>	No catch limit	
<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>				Open access fishery	
<b>1</b>					<b>1</b>		Money making potential / livelihood	
<b>1</b>	<b>1</b>		<b>1</b>		<b>1</b>		Lack of alternative income generating livelihoods for fishers	
<b>↑</b>	<b>↑</b>				<b>1</b>		Unemployment and poverty in fisheries sector due to the reduction in catches	
					<b>1</b>		Internal restaurant trade (Chinese)	
						<b>↑</b>	International market demand	(1) Overexploitation
							Declines in population of sea cucumber	3,3,3 Fisheries & Aquaculture
								Arid climate = erosion and sedimentation
								Sea level rise
								Changes in river flow and sediment load
								Coral bleaching
								Ocean acidification
								Environmental
					<b>1</b>	<b>1</b>	Poor processing of industrial effluents	
				<b>^</b>	<b>^</b>	<b>↑</b>	Lack of investment in wastewater treatment and disposal infrastructure	(23) Discharge of untreated industrial effluents
								Industry
[G] Poverty & inequality	[F] Population pressure & demographics	awareness [E] Cultural traditions	[D] Inadequate knowledge &	[C] Inadequate financial resources	[B] Economic drivers	[A]Inappropriate governance	Underlying Social, Economic, Legal and Political Causes	Sector and Underlying Resource Use Practice

	water for irrigation	(4) Abstraction of		IIIdilgiOves	(5) Clearing of	Agriculture & Forestry							productivity of system	leading to decreased	practices (trawling)	from bad fishing	(3) Physical damage						juveniles	(2) Overexploitation of										(1) Overfishing	Fisheries &	3.3.4	Sector and Underlying Resource Use Practice	
Poor planning	Economic priorities	Expansion of commercial agriculture sector	Lack of alternative construction material	Lack of alternative fuel source	Demand for wood products for building and fuel	*	No respect for good environmental practices	Better technology increased effort	No enforcement	Illegal fishing - increases with decline in catches	No management plan	Increased fuel prices	1_	Overcapitalisation	Competition with aquaculture	Profit drive, high value	Market demand	Lack of MCS	Lack of regulations and management plan	Lack of knowledge	Little gear choice	High investment in gear / boats	High demand and market prices	Lack of access to post-harvest processing facilities	Post-harvest losses	Lack of monitoring and control	No management plan	Overcapitalisation	requires minimum investment	Increase in traditional fishing as no licencing, or tax and	Overcapacity of fichary	Lack of alternative employment	Increasing unemployment	Market demand		Declines in population of prawn and shrimp	Underlying Social, Economic, Legal and Political Causes	
<b>1</b>								<b>1</b>	1	1	1			<b>1</b>				<b>1</b>	1							<b>^</b>	1	1		•	1						[A]Inappropriate governance	
	<b>1</b>	<b>1</b>			1							<b>1</b>	1	1	1	1	1					1	1					1	1	•		<b>1</b>		<b>1</b>			[B] Economic drivers	
<b>1</b>									1		1		1					1	1		1			1	1	1	1	1									[C] Inadequate financial resources	
<b>1</b>							<b>1</b>				1							<b>1</b>		1	1				1												[D] Inadequate knowledge &	
																									1												[E] Cultural traditions	Koot
					1		<b>1</b>			<b>1</b>																							<b>1</b>				[F] Population pressure & demographics	Koot Causes
			<b>1</b>	<b>↑</b>	1		<b>1</b>			<b>1</b>															1				1	•	1	<b>1</b>	<b>1</b>				[G] Poverty & inequality	
																																					[H] Climate change & natural	
																																					[I] Voluntary action fills the	
							<b>1</b>			1															1												[J] Personal Attitude	

						Root Causes	auses			
		ernance		cial resources	ledge &	5	re &	lity	natural	lls the
Sector and		ppropriate gover	onomic drivers	adequate financia	adequate knowle	Itural traditions	pulation pressure	overty & inequalit	imate change & n	luntary action fills nance void rsonal Attitude
Use Practice	Underlying Social, Economic, Legal and Political Causes	[A]I	[B]	[C]		[E]		[G]		gov
	Lack of access to technology	1		1	1					
	Lack of technical and financial capacity	<b>→</b>			<b>1</b>					
Mining										
(6) Coral mining for lime	Demand for building materials		<b>1</b>			<b>1</b>				
	Lack of alternative / expensive	1	<b>^</b>				1	1		
Industry										
(7) Clearing of	Demand for salt		<b>↑</b>							
production	Lack of alternative liveilhood						<b>1</b>	<b>1</b>		
	Commercial profits		<b>↑</b>							
	Poor planning	<b>^</b>		<b>1</b>						
Urbanisation										
(8) Clearing of mangroves /	Demand for timber for construction and fuel	<b>↑</b>	<b>↑</b>				<b>↑</b>	<b>↑</b>		
Environmental										
Changes in freshwaterinput and rainfall / run-off									<b>↑</b>	
Changes in nutrients, primary and secondary									<b>↑</b>	
Rainfall									<b>1</b>	
3.3.5	Declines in population of lobster									
Fisheries										
(1) Artisanal fishery (i) Non-selective gear	Open access fishery (no licences no regulations)	1	1							
(tangle nets, traps)	Lack of education and awareness (but the fishers know)	1			<b>1</b>					
(ii) Diving (SCUBA and	Tragedy of commons	<b>↑</b>	<b>^</b>							
(iii) Collection of egg	Greed		<b>^</b>							
bearing females	High market prices		<b>^</b>							
undersized individuals	Still profitable		<b>^</b>							
	Reduction in the number of export companies		<b>↑</b>							
	Lack of management - collapse of government	<b>1</b>	<b>↑</b>							
	No law enforcement	<b>1</b>								
	No capacity for management	<b>↑</b>								
	No resources (financial or human)			<b>1</b>						
	Lack of technical training (for new generation)	<b>→</b>		1	<b>1</b>					
	Other priorities (i.e. security)			<b>1</b>						
(2) Industrial fishery	Open access fishery (no licences no regulations)									
(i) Trawl nets (big and small mesh sizes)	Licences should be paid for but there is no one to ask for the payment	<b>1</b>								

	•	<b>个</b>				<b>^</b>	<b>1</b>	Political driver (due to the need for foreign revenues)	
				<b>↑</b>		<b>^</b>		Cultural attitude towards openness to exploit the sea	
							<b>^</b>	Weak enforcement	
							<b>^</b>	Conflicting policies (employment focus v sustainability)	(viii) Increased use of technology fishing
				<b>1</b>	<b>1</b>		<b>1</b>	Lack of fisheries management plans for some species	Unreported
						<b>1</b>	1	Overcapitalisation of fisheries leading to increased competition	(raus) (vii) Illegal, Unregulated and
	·	<b>↑</b>			<b>↑</b>		<b>↑</b>	Lack of compliance	(vi) Inappropriate gear
							1	Poor legislation and framework	exclusion devices
					<b>1</b>		<b>^</b>	Lack of MCS	BRDs
							<b>^</b>	Lack of gear regulations (for selective gear)	(iv) Low efficiency of
						<b>^</b>		Lack of market / low prices for certain species	selective gear
		<b>1</b>				<b>↑</b>		Selection pressure and consumer demand for certain species (others discarded)	pressure (ii) Use of non-
	·	<u>т</u>	<b>1</b>			<b>1</b>		Local market demand	(i) Increased fishing
						1		International market demand	(1) Increased bycatch
									Fisheries & Aquaculture
								Bycatch and discards	3.4
							<b>↑</b>	EEZ not declared so no legal boundaries (can claim fishing in international waters	
							1	Irresponsible fishing companies know they can get away with fishing illegally	
							1	Internal conflicts on boundaries (between Puntland and Somaliland)	undersized individuals
							1	Lack of management - collapse of government	(iii) Collection of
							<b>↑</b>	No administration authority to collect fees	(ii) Collection of egg-
[H] Climate change & natural nrocesses [I] Voluntary action fills the	demographics [G] Poverty & inequality	[F] Population pressure &	awareness [E] Cultural traditions	[D] Inadequate knowledge &	[C] Inadequate financial resources	[B] Economic drivers	[A]Inappropriate governance	Underlying Social, Economic, Legal and Political Causes	Sector and Underlying Resource Use Practice
	1		-						
	ď	Root Causes	X OC						