

FIGURES AND TABLES

Per Capita Monthly Expenditure by Income Groups (NTB)

Region	NTB Urban Area						NTB Rural Area						Average		
	upto 40	40-60	60-80	80-100	100-150	150-200	upto 40	40-60	60-80	80-100	100-150	150-200		200-300	300-500
Income (Rp/000)	29,523	41,444	52,538	65,985	87,360	114,074	31,511	41,854	55,346	69,523	87,940	120,258	145,875	156,907	134,108
Total Food (Rp)	6,375	12,407	16,225	21,040	26,860	34,415	6,097	10,781	14,920	20,713	32,000	49,390	85,116	215,652	598,051
Total Non-Food (Rp)	35,600	53,851	68,753	88,983	124,220	174,489	37,608	52,635	70,264	90,036	119,740	169,656	230,991	372,559	732,159
Expenditure for Fish (Rp)	231	1,577	2,986	4,215	5,674	9,859	1,179	2,615	3,209	4,419	7,209	10,289	16,091	22,153	16,724
Fish to total expenditure	0.6%	2.9%	4.3%	6.4%	6.5%	5.7%	3.1%	4.8%	4.7%	4.9%	6.0%	6.1%	7.0%	5.9%	2.3%
Fish to total food	0.8%	3.8%	5.7%	6.4%	6.5%	8.8%	3.7%	6.0%	6.0%	6.4%	8.2%	8.6%	11.0%	14.1%	12.5%

Per Capita Monthly Expenditure by Income Groups (NTT)

Region	NTT Urban Area						NTT Rural Area						Average		
	upto 40	40-60	60-80	80-100	100-150	150-200	upto 40	40-60	60-80	80-100	100-150	150-200		200-300	300-500
Income (Rp/000)	29,076	38,444	49,687	62,314	79,757	107,205	27,878	37,873	51,539	65,300	84,633	116,604	136,000	172,900	267,863
Total Food (Rp)	7,430	14,075	20,943	27,860	41,525	64,320	7,771	12,366	17,726	23,934	33,955	57,208	91,043	221,150	571,534
Total Non-Food (Rp)	37,006	52,519	70,630	90,174	121,282	171,525	35,509	50,189	69,265	89,234	118,588	173,812	227,043	394,026	639,697
Expenditure for Fish (Rp)	1,875	3,535	3,919	6,032	8,335	9,993	340	1,185	2,466	3,755	6,445	12,416	13,832	4,907	76,387
Fish to total expenditure	5.0%	6.7%	5.5%	6.7%	6.9%	6.6%	1.0%	2.4%	3.6%	4.2%	5.4%	7.1%	6.1%	1.3%	4.0%
Fish to total food	6.3%	9.2%	7.9%	9.7%	10.5%	9.9%	1.2%	3.1%	4.8%	5.8%	7.6%	10.6%	10.2%	2.8%	0.0%

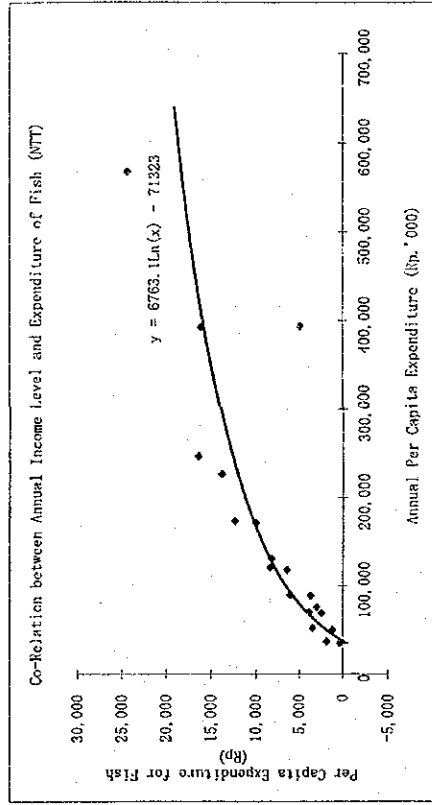
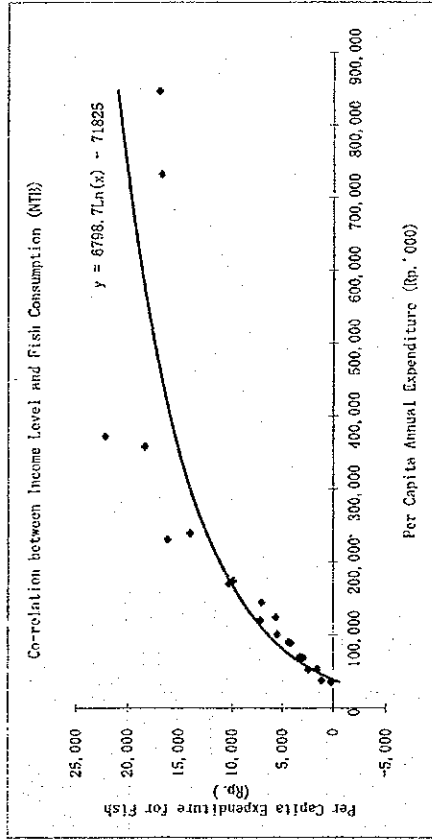


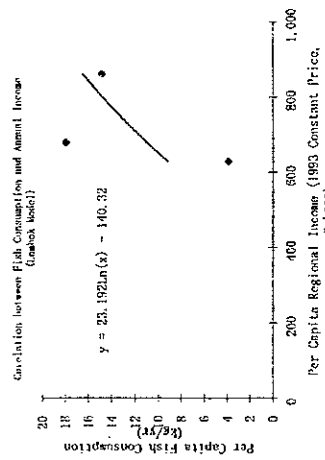
Fig. 1.1.1 Co-relation Between Per Capita Expenditure for Fish and Annual Expenditure by Different Income Groups

(1) Co-relation with Per Capita Regional Income

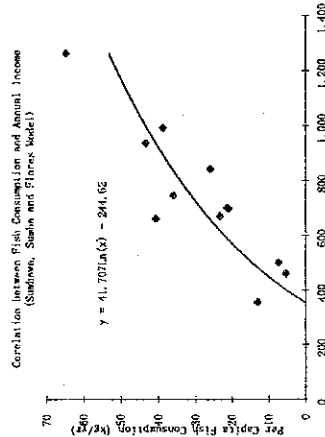
District	Per-Capita Regional Income (Rp/yr)	Per-Capita Fish Consumption (kg/yr)
Lombok	863	14.8
Lombok Barat	629	3.9
Lombok Tengah	680	17.0
Lombok Timur	1,264	64.8
Sumbawa	924	38.8
Doropo	938	43.5
Bima	462	5.7
Sumba Barat	844	26.0
Sumba Timur	382	7.4
(West Flores)	699	21.0
Manggalar	747	36.0
(East Flores)	672	23.4
Ende	702	21.5
Sikka	356	13.1
Flores Timur	662	40.8
(Timor)	1,185	53.2
Kupang	517	0.1
Timor Tengah	624	3.2
Timor Tengah	625	8.2
Belu		

(2) Co-relation with Price of Fish

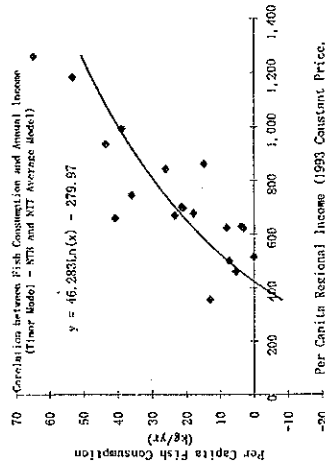
District	Average value of fish (Rp/kg)	Per Capita fish consumption (kg/yr)
(NTB)	7,283	14.8
Lombok Barat	3,656	3.9
Lombok Tengah	7,193	17.0
Lombok Timur	2,351	64.8
Sumbawa	2,865	38.8
Doropo	1,657	43.5
(NTT)	3,230	5.7
Sumba Barat	1,778	26.0
Sumba Timur	4,377	7.4
Manggalar	2,520	21.0
Ende	3,972	36.0
Sikka	3,498	23.4
Flores Timur	1,266	21.5
Lembata	1,226	13.1
Alor	2,643	40.8
Kupang	1,259	0.1
Timor Tengah	2,590	3.2
Timor Tengah	2,550	8.2
Belu		
NTB Total	4,063	23.8
NTT Total	2,391	18.3



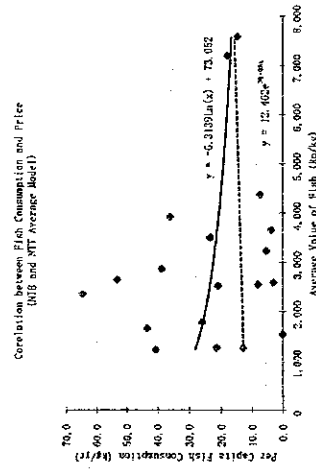
LOMBOK MODEL



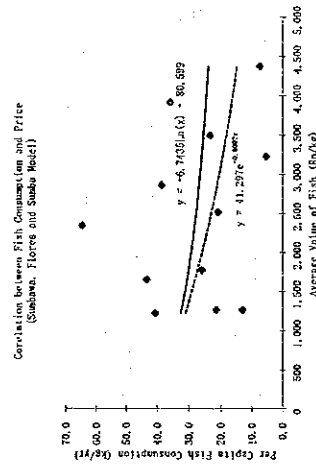
SUMBAWA, SUMBA AND FLORES MODEL



TIMOR MODEL (AVERAGE MODEL OF WHOLE STUDY AREA)



NTB & NTT AVERAGE MODEL



SUMBAWA, SUMBA AND FLORES MODEL

Fig. 1.1.2 Co-relation Between Fish Consumption and Per Capita Regional Income and Fish Price

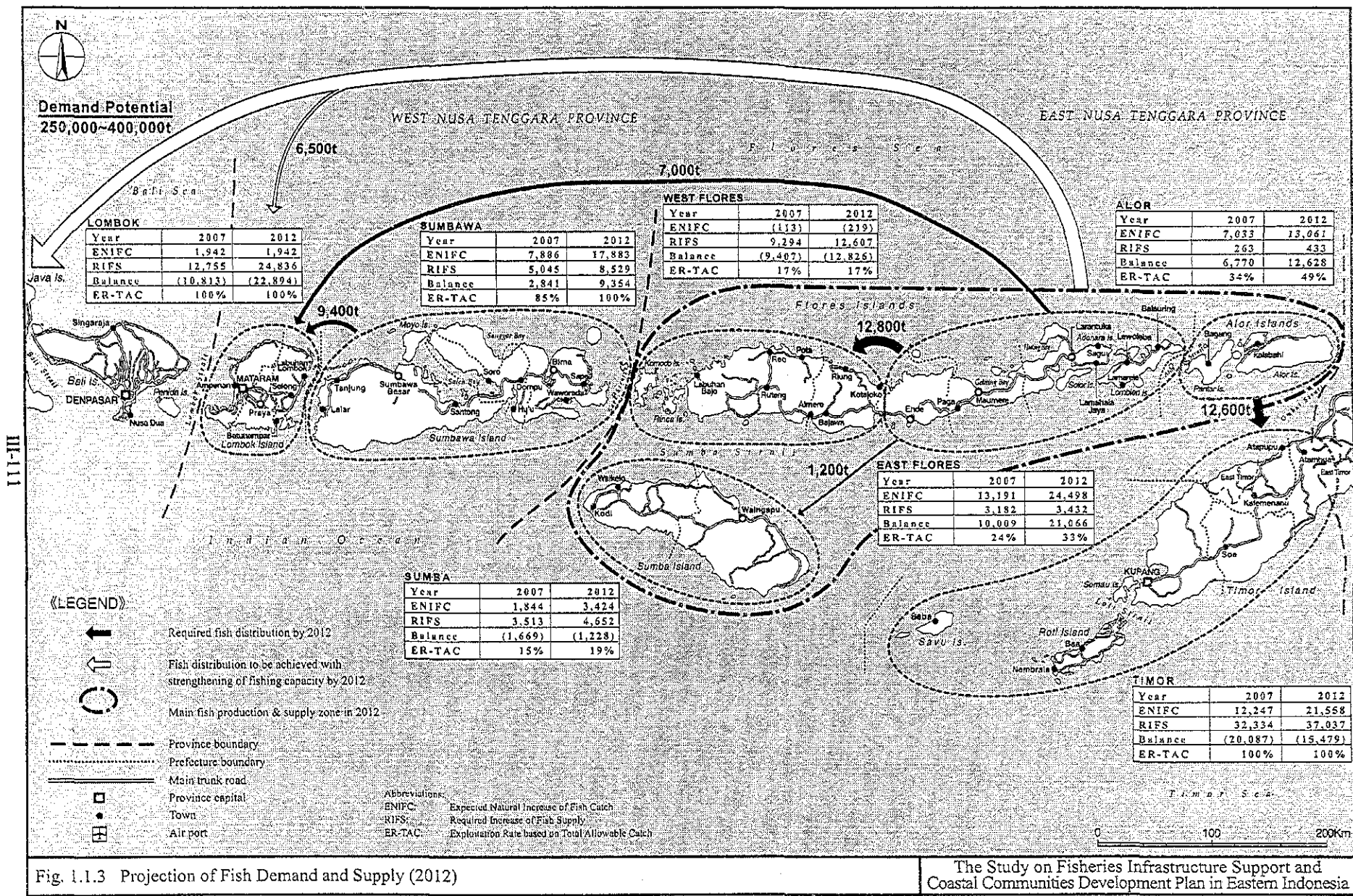


Fig. 1.1.3 Projection of Fish Demand and Supply (2012)

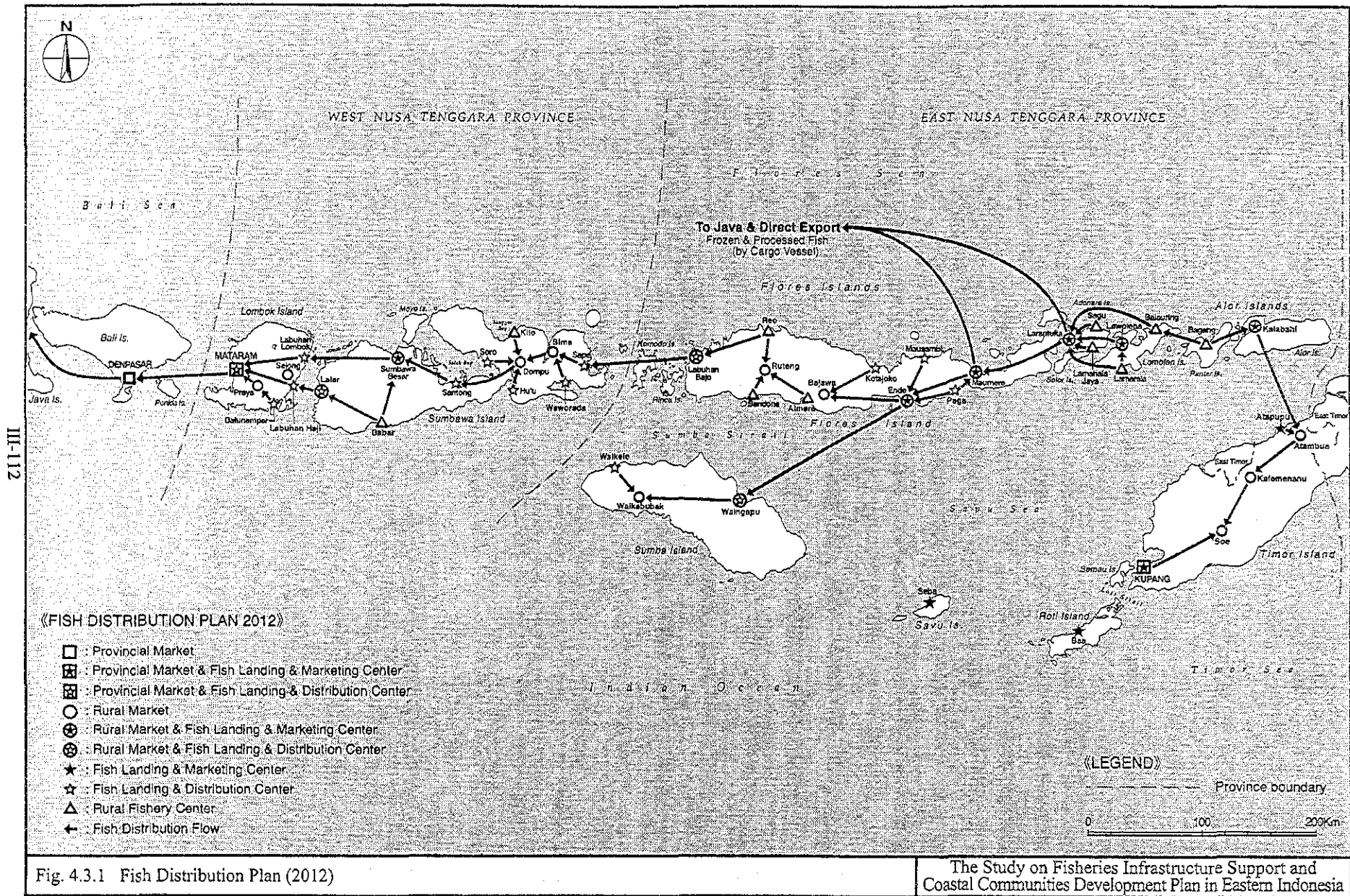
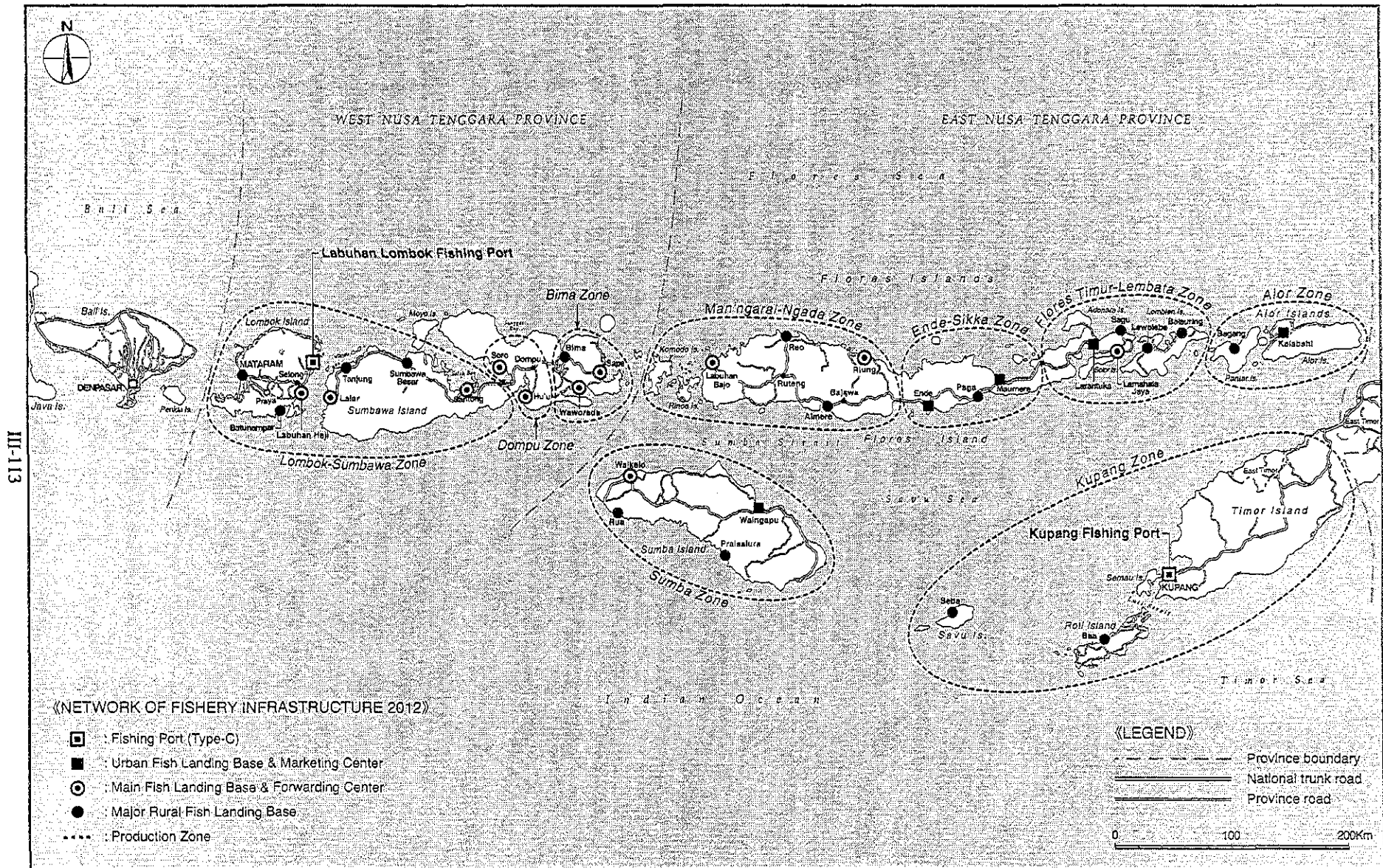


Fig. 4.3.1 Fish Distribution Plan (2012)



III-113

Fig. 4.4.1 Network of Fishery Infrastructure (2012)

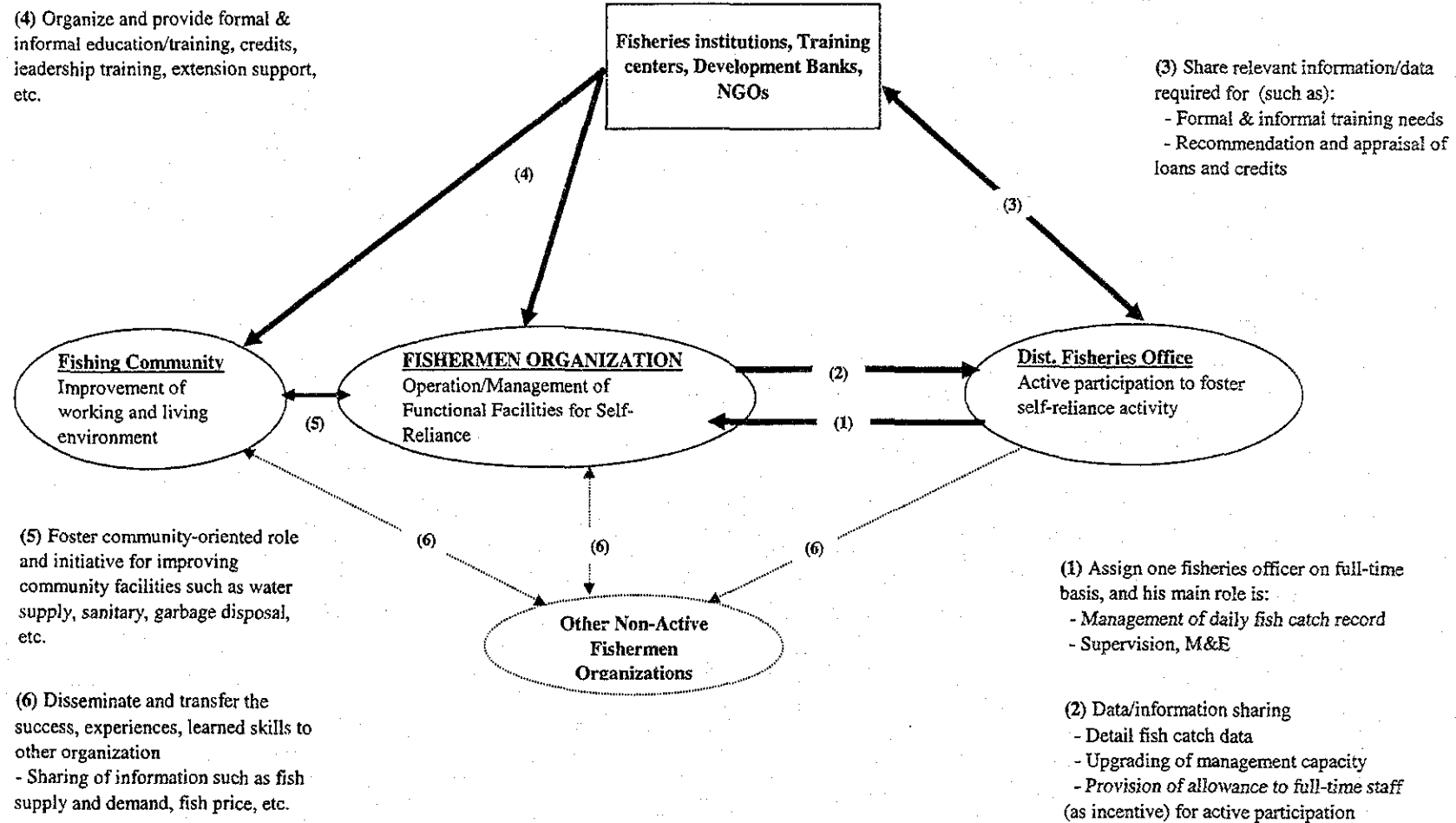


Fig. 4.6.1 Collaborative Management System for Self-Reliance of Fishermen Organization

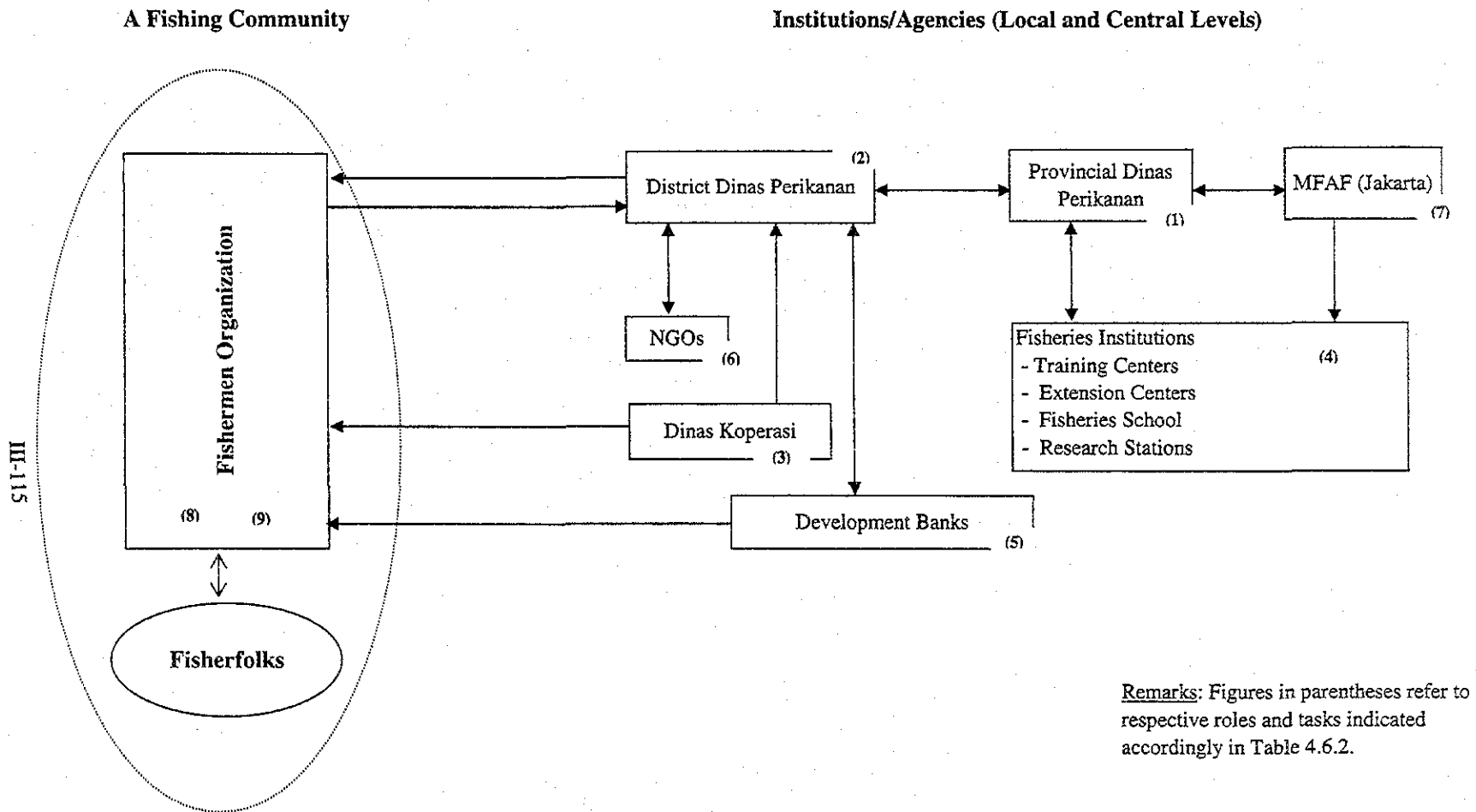


Fig. 4.6.2 Expected Roles and Tasks of Relevant Institutions for Strengthening of A Fishing Community

Table 1.1.1 Projection of Population in 2007 and 2012

District	Total Population (1,000)					Annual Rate of Increase (%)					
	1990	1995	1999	2007	2012	1980/90	1990/95	1995/99	1990/99	1999/2007	2007/2012
Lombok Barat	859	957	1,034	1,173	1,269	2.75	2.18	1.97	2.09	1.59	1.59
Lombok Tengah	679	716	749	785	808	1.64	1.06	1.13	1.09	0.59	0.59
Lombok Timur	865	886	969	1,030	1,070	1.78	0.48	2.25	1.26	0.76	0.76
(Total Lombok)	2,403	2,559	2,751	2,987	3,147	-	1.26	1.83	1.52	1.02	1.02
Sumbawa	374	402	416	439	454	2.06	1.47	0.83	1.18	0.68	0.68
Dompu	145	169	193	241	276	4.22	3.12	3.48	3.28	2.78	2.78
Bima	448	481	509	548	574	2.02	1.42	1.44	1.43	0.93	0.93
(Total Sumbawa)	967	1,052	1,118	1,228	1,304	-	1.70	1.55	1.63	1.13	1.13
NTB Total	3,370	3,610	3,870	4,215	4,451	2.15	1.59	1.75	1.55	1.05	1.05
Sumba Barat	292	328	342	379	404	2.32	2.39	1.02	1.78	1.28	1.28
Sumba Timur	153	171	179	198	211	2.20	2.32	1.09	1.77	1.27	1.27
(Total Sumba)	445	500	521	577	615	-	2.37	1.05	1.78	1.28	1.28
Manggarai	499	559	596	670	721	2.32	2.28	1.60	1.98	1.48	1.48
Ngada	198	211	218	229	236	1.39	1.23	0.91	1.10	0.60	0.60
(Total West Flores)	697	770	814	899	957	-	2.00	1.41	1.74	1.24	1.24
Ende	219	229	231	234	235	0.82	2.89	0.29	0.62	0.12	0.12
Sikka	247	261	256	256	256	1.17	1.16	(0.53)	0.40	0.00	0.00
Flores Timur	266	269	192	194	196	0.31	0.24	1.12	0.63	0.13	0.13
Lembata			89	90	90	0.31	0.24	1.12	0.63	0.13	0.13
(Total East Flores)	731	759	768	774	777	-	0.75	0.31	0.55	0.05	0.05
Alor	145	154	158	165	169	1.47	1.33	0.60	1.00	0.50	0.50
(Total Flores)	145	154	158	165	169	1.47	1.33	0.60	1.00	0.50	0.50
Kupang	523	595	610	673	673	2.64	2.63	0.63	1.73	1.23	0.00
Timor Tensel	348	381	385	405	417	1.85	1.87	0.23	1.13	0.63	0.63
Timor Tenuta	163	181	190	209	222	1.97	2.10	1.24	1.72	1.22	1.22
Belu	216	237	259	293	316	1.78	1.84	2.30	2.05	1.55	1.55
(Total Timor)	1,250	1,394	1,444	1,580	1,629	-	2.21	0.89	1.62	1.12	1.12
NTT Total	1,839	2,048	2,124	2,322	2,413	1.79	1.82	0.91	1.61	1.11	1.11
Survey Area Total	5,209	5,659	5,993	6,537	6,864	-	1.67	1.45	1.57	1.07	1.07
Reference:											
(Bali Total)	2,778	2,896	3,053	3,191	3,280	1.18	0.83	1.33	1.05	0.55	0.55
(Java Timur Total)	32,504	33,844	35,160	36,235	36,923	1.08	0.81	0.96	0.88	0.38	0.38
(Sulawesi Selatan Total)	6,982	7,558	8,090	8,866	9,389	1.42	1.60	1.72	1.65	1.15	1.15

Table 1.1.2 Projection of GRDP and Per Capita Regional Income (Based on 1993 constant price)

	GRDP (1993 constant price, Million Rp.)					growth rate (1993/99)	Projection of GRDP		GRDP by Fisheries Sector (Million Rp)					Contribution of Fisheries Sector to PDRB (%)				Regional Income Per Capita (Rp.1000)					Annual growth rate (1993/99)	Estimated Regional Per Capita Income	
	1993	1996	1997	1998	1999		2007	2012	1996	1997	1998	1999	1996	1997	1998	1999	1993	1996	1997	1998	1999	2007		2012	
	Lombok Barat	456,607	558,823	587,783	554,669		563,640	3.60%	748,189	893,083	15,047	15,369	16,630	17,622	2.69%	2.61%	3.00%	3.13%	700	803	826	762		731	0.72%
Lombok Tengah	394,533	483,014	499,676	489,620	495,430	3.91%	673,118	815,237	3,633	4,095	4,226	4,385	0.75%	0.82%	0.86%	0.89%	537	636	650	630	629	2.69%	778	889	
Lombok Timur	518,154	653,575	689,657	670,245	685,850	4.84%	1,001,086	1,268,011	18,791	19,814	12,834	19,241	2.88%	2.87%	1.91%	2.81%	553	675	702	673	680	3.51%	895	1,064	
Kodya Mataram	268,623	358,983	386,115	376,055	380,892	6.08%	610,839	820,598	5,257	5,364	3,522	3,347	1.46%	1.39%	0.94%	0.88%	854	1,099	1,152	1,097	1,085	4.11%	1,498	1,832	
(Total Lombok)	1,637,916	2,054,395	2,163,231	2,090,589	2,125,812	4.49%	3,033,232	3,796,929	42,728	44,642	37,212	44,595	2.08%	2.06%	1.78%	2.10%	624				734	2.77%	913	1,047	
Sumbawa	384,216	484,042	516,263	512,419	564,566	6.73%	950,825	1,317,020	33,229	36,228	34,518	36,227	6.86%	7.02%	6.74%	6.42%	944	1,140	1,195	1,184	1,264	5.06%	1,876	2,400	
Dompu	144,932	178,751	188,301	190,336	204,312	5.98%	325,052	434,499	7,920	8,049	7,490	8,673	4.43%	4.27%	3.94%	4.24%	868	965	984	960	994	2.29%	1,192	1,335	
Bima	383,500	478,108	499,890	489,039	505,638	4.77%	734,123	926,775	25,204	25,711	26,212	26,727	5.27%	5.14%	5.29%	5.14%	784	933	964	925	938	3.04%	1,192	1,384	
(Total Sumbawa)	912,648	1,140,901	1,204,454	1,191,794	1,274,516	5.81%	2,010,000	2,678,294	66,353	69,988	68,220	71,627	5.82%	5.81%	5.72%	5.62%	859				1,083	3.97%	1,478	1,796	
NTB Total	2,558,564	3,195,296	3,367,685	3,282,383	3,400,328	4.97%	5,012,015	6,387,333	109,081	114,630	105,432	116,222	3.41%	3.40%	3.21%	3.42%	689	826	855	815	826	3.10%	1,055	1,229	
Sumba Barat	142,159	166,116	170,655	169,937	170,653	3.12%	218,124	254,285	1,480	1,853	2,007	2,025	0.89%	1.09%	1.18%	1.19%	449	478	482	461	462	0.48%	480	491	
Sumba Timur	131,889	166,391	172,407	166,819	164,803	3.82%	222,416	268,250	7,717	6,655	6,378	5,579	4.64%	3.86%	3.82%	3.39%	780	908	922	872	844	1.33%	938	1,002	
(Total Sumba)	274,047	332,507	343,062	336,756	335,456	3.46%	440,539	522,535	9,197	8,508	8,385	7,604	2.77%	2.48%	2.49%	2.27%	562				593	0.89%	636	665	
Manggarai	255,283	305,467	313,365	320,788	313,561	3.52%	413,431	491,421	6,629	9,932	9,977	9,419	2.17%	3.17%	3.11%	3.00%	467	513	514	503	502	1.22%	553	588	
Ngada	118,889	145,699	155,483	152,409	154,694	4.54%	220,585	275,353	3,011	3,919	4,610	4,379	2.07%	2.52%	3.02%	2.83%	560	658	695	684	699	3.79%	942	1,134	
(Total West Flores)	374,172	451,166	468,788	473,197	468,255	3.85%	634,016	766,774	9,640	13,851	14,587	13,798	2.14%	2.95%	3.08%	2.95%	493				555	2.01%	650	718	
Ende	150,007	182,200	193,303	185,724	180,369	3.14%	231,054	269,732	9,587	9,832	9,967	9,045	5.26%	5.09%	5.37%	5.01%	642	758	801	743	747	2.57%	916	1,040	
Sikka	140,319	177,560	188,563	188,732	188,972	5.15%	282,419	363,040	11,289	11,979	11,824		6.36%	6.35%	6.26%		528	693	699	672	672	4.13%	928	1,136	
Flores Timur	125,505	163,598	168,748	123,679	148,441	6.89%	252,908	352,853	10,949	13,835	9,399	9,518	6.69%	8.20%	7.60%	6.41%	441	578	594	625	702	8.23%	1,322	1,962	
Lembata				33,222	37,532	4.05%	51,553	62,866			4,833	4,106			14.55%	10.94%				269	356	8.23%	670	995	
(Total East Flores)	415,830	523,358	550,612	531,357	555,314	5.00%	817,934	1,048,490	31,825	35,646	36,023	22,669	6.08%	6.47%	6.78%	4.08%	531				666	3.87%	902	1,090	
Alor	88,595	110,663	115,027	112,151	112,151	4.05%	154,049	187,854	4,575	5,403	5,946	6,550	4.13%	4.70%	5.30%	5.84%	569	677	700	674	662	2.57%	811	920	
(Total Alor)	88,595	110,663	115,027	112,151	112,151	4.05%	154,049	187,854	4,575	5,403	5,946	6,550	4.13%	4.70%	5.30%	5.84%	569	677	700	674	662	2.57%	811	920	
Kupang	573,867	800,497	835,477	785,305	828,589	6.41%	1,362,275	1,858,738	20,281	32,562	26,158	31,681	2.53%	3.90%	3.33%	3.82%	984	1,228	1,250	1,149	1,185	3.17%	1,521	1,778	
Timor Tensei	165,394	200,008	217,348	211,363	211,363	4.22%	294,092	361,529	73	130	76	38	0.04%	0.06%	0.04%	0.02%	442	499	540	509	517	2.66%	637	726	
Timor Tenuta	99,447	117,964	126,519	118,560	118,569	3.00%	150,159	174,046	237	334	593	388	0.20%	0.26%	0.50%	0.33%	555	616	648	595	624	1.98%	730	805	
Belu	122,147	154,778	168,579	162,462	162,462	4.93%	238,702	303,596	2,817	2,818	3,531	2,699	1.82%	1.67%	2.17%	1.66%	514	612	657	622	625	3.32%	811	955	
(Total Timor)	960,855	1,273,247	1,347,923	1,277,690	1,320,983	5.52%	2,045,228	2,697,908	23,408	35,844	30,358	34,806	1.84%	2.66%	2.38%	2.63%	698				833	3.00%	1,054	1,222	
NTT Total	2,113,500	2,690,941	2,825,412	2,731,181	2,792,159	4.81%	4,064,873	5,140,304	78,645	99,252	95,299	85,427	2.92%	3.51%	3.49%	3.06%	587	731	698	704	783	3.08%	897	1,044	
Survey Area Total	4,664,064	5,886,237	6,193,097	6,013,534	6,192,487	4.90%	9,076,888	11,527,637	187,726	213,882	200,731	201,649	3.19%	3.45%	3.34%	3.26%	653				783	3.10%	999	1,164	
Reference:																									
Bali Total	5,689,921	7,141,773	7,556,533	7,250,948	7,299,401	4.28%	10,209,750	12,592,009									1,901	2,447	2,556	2,421	2,406	4.05%	3,305	4,030	
Java Timur Total	49,172,247	61,752,469	64,346,958	53,976,382	54,270,012	1.66%	61,931,822	67,260,496									1,405	1,814	1,872	1,556	1,551	1.66%	1,769	1,921	
Sulawesi Selatan Total	7,511,772	9,485,863	9,893,420	9,366,229	9,631,076	4.27%	13,460,601	16,593,308									979	1,241	1,273	1,185	1,200	3.48%	1,577	1,871	

Table 1.1.4 Comparison Between Expected Local Fish Demand and Fish Catch in 2007 and 2012

Region/District	Type of Demand Projection	Target Per Capita Fish Consumption (kg/yr)		Required Fish Supply (RFS) (ton/yr)		Present Supply (ton/yr)	Required Increase of Fish Supply (RIFS)		Total Allowable Catch	Catch in 1999 (ton/yr)	Increase Rate of Fish Catch in 1993-99	Estimated Fish Catch by Natural Increase		Resources Exploitation Rate based on TAC (%)		Catch Difference from catch in 1999 (CD)		Balance (CD- RIFS)	
		2007	2012	2007	2012		2007	2012				2007	2012	2007	2012	2007	2012	2007	2012
Lombok Barat	Case 2	17.8	18.6	20,877	23,642	15,280	5,597	8,362	16,197	12,132	1.10	13,594	16,197	84%	100%	1,462	4,065	(4,135)	(4,297)
Lombok Tengah	Case 2	14.1	17.2	11,048	13,873	2,897	8,151	10,976	4,200	1,340	1.40	1,967	2,504	47%	60%	627	1,164	(7,524)	(9,812)
Lombok Timur	Case 2	17.3	21.3	17,832	22,799	17,331	501	5,468	11,400	16,383	1.57	16,236	13,096	142%	115%	(147)	(3,287)	(648)	(8,755)
(Lombok Total)		16.7	19.2	49,757	60,314	35,509	14,248	24,805	31,797	29,855	1.33	31,797	31,797	100%	100%	1,942	1,942	(12,306)	(22,863)
Sumbawa	Case 1	64.8	64.8	28,442	29,425	26,937	1,505	2,488	33,353	22,365	1.18	26,938	33,353	81%	100%	4,573	10,988	3,068	8,500
Dongru	Case 1	38.8	38.8	9,342	10,714	7,502	1,840	3,212	7,492	6,940	1.17	7,492	7,492	100%	100%	532	532	(1,288)	(2,660)
Bina	Case 1	43.5	43.5	23,834	24,963	22,134	1,700	2,829	25,808	19,465	1.12	22,227	25,808	86%	100%	2,762	6,343	1,062	3,514
(Sumbawa Total)		50.2	49.9	61,618	65,102	56,573	5,045	8,529	66,653	48,770	1.15	56,656	66,653	85%	100%	7,886	17,883	2,841	9,354
NTB Total		26.4	28.2	111,375	125,415	92,081	19,293	33,334	98,450	78,625	1.22	88,453	98,450	90%	100%	9,828	19,825	(9,465)	(13,509)
Sumba Barat	Case 2	12.8	13.8	4,860	5,581	1,860	3,001	3,722	16,920	1,596	1.15	1,868	2,101	11%	12%	272	505	(2,729)	(3,216)
Sumba Timur	Case 3	26.5	26.5	5,249	5,592	4,662	387	930	33,840	4,411	1.31	5,983	7,330	18%	22%	1,572	2,919	984	1,989
(Sumba Total)		17.5	18.2	10,109	11,173	6,523	3,588	4,652	50,760	6,007	1.26	7,851	9,431	15%	19%	1,844	3,424	(1,744)	(1,227)
Manggarai	Case 2	18.8	21.3	12,587	15,378	4,434	8,154	10,944	44,718	5,474	0.91	4,907	4,421	11%	10%	(567)	(1,053)	(8,721)	(11,998)
Ngada	Case 3	26.5	26.5	6,067	6,250	4,387	1,480	1,663	11,332	4,333	1.09	4,782	5,167	42%	46%	449	834	(1,031)	(829)
(West Flores Total)		20.7	22.6	18,654	21,628	9,021	9,634	12,607	56,050	9,807	0.98	9,689	9,588	17%	17%	(118)	(219)	(9,752)	(12,826)
Ende	Case 1	36.0	36.0	8,420	8,622	8,338	83	284	20,092	7,200	1.09	7,930	8,555	39%	43%	730	1,355	647	1,071
Sikka	Case 3	26.5	26.5	6,854	6,854	5,993	861	861	20,092	7,911	1.54	12,919	17,212	64%	86%	5,008	9,301	4,147	8,440
Flores Timur	Case 3	26.5	26.5	5,149	5,182	4,128	1,021	1,054	20,092	7,988	1.73	14,796	20,633	48%	67%	6,810	12,647	5,789	11,592
Lembata	Case 2 & 3	23.5	26.5	2,376	2,391	1,158	1,218	1,233	10,580	1,246	1.44	1,890	2,442	2%	3%	644	1,196	(574)	(37)
(East Flores Total)		29.5	29.7	22,799	23,050	19,617	3,182	3,432	70,856	24,343	1.44	37,534	48,841	53%	69%	13,191	24,498	10,010	21,066
Alor	Case 1	40.8	40.8	6,712	6,882	6,449	263	433	40,184	6,734	1.90	13,767	19,795	34%	49%	7,033	13,061	6,770	12,628
(Alor Total)		40.8	40.8	6,712	6,882	6,449	263	433	40,184	6,734	1.90	13,767	19,795	34%	49%	7,033	13,061	6,770	12,628
Kupang	Case 1	53.2	53.2	35,781	35,781	20,683	15,098	15,098	25,380	26,820	1.40	39,358	48,919	155%	193%	12,538	22,099	(2,560)	7,001
Timor Tensei	Case 2	18.9	25.0	7,639	10,416	44	7,595	10,372	8,469	27	0.62	15	5	0%	0%	(12)	(22)	(7,607)	(10,394)
Timor Tenuta	Case 2 & 3	25.2	26.5	5,271	5,695	600	4,671	5,295	8,460	272	2.93	885	1,411	10%	17%	613	1,139	(4,058)	(4,156)
Bela	Case 3	26.5	26.5	7,763	8,385	2,115	5,651	6,270	8,460	2,083	0.63	1,190	425	14%	5%	(893)	(1,658)	(6,543)	(7,928)
(Timor Total)		35.7	37.1	56,456	60,477	23,442	33,015	37,035	50,760	29,262	1.30	41,449	50,760	82%	100%	12,247	21,558	(20,768)	(15,477)
NTT Total		28.7	29.7	114,732	123,209	65,050	49,682	58,160	268,610	76,093	1.32	110,290	138,416	41%	52%	34,197	62,323	(15,485)	4,163
Survey Area Total		27.5	28.9	226,106	248,625	157,131	68,975	91,494	367,060	154,718	1.27	198,743	236,866	54%	65%	44,025	82,148	(24,950)	(9,346)

Remarks:

(1) Type of Demand Projection

Case 1: Based on population growth at constant level of fish consumption (Current per capita fish consumption is higher than the target set forth by PROTEKAN 2003.)

Case 2: Based on the population growth and the growth of purchase ability (Purchase ability is not enough to achieve the target of PROTEKAN.)

Case 3: Based on the target fish consumption (26.5 kg/year) set forth by PROTEKAN 2003 and the population growth (Purchase ability is enough to achieve the target.)

(2) Naturally expected fish catch (NEFC) is calculated based on the condition that the fish catch will increase at same rate during 1993-99, but limited to the TAC level set forth in each Region.

Reference:

Provinces to be main markets from study area	Type of Demand Projection	Target Per Capita Fish Consumption (kg/yr)		Required Fish Supply (RFS) (ton/yr)		Present Supply (ton/yr)	Required Increase of Fish Supply (RIFS)		Necessity to import fish from others
		2007	2012	2007	2012		2007	2012	
Bali, Jawa Timur, Sulawesi Selatan	Case 1	47.5	47.5	151,555	155,799	145,084	6,471	10,715	No
	Case 3 (low)	12.8	17.0	463,806	627,693	212,705	251,100	414,988	Yes
	Case 1	44.3	44.3	392,780	415,929	358,457	34,323	57,472	No

Table: 4.2.1 Role of Public and Private Sector in Aquaculture Development

Items	Initial stage			Latter stage		
	Research Institute	Regional Gov.	Private	Research Institute	Regional Gov.	Private
Estimate of the Potential Area	○	⊙	-	-	⊙	-
Draw up the regulations	○	⊙	-	○	⊙	-
Technology Development						
New cultivable species development	⊙	-	-	⊙	-	-
Broodstock breeding/Egg supply	⊙	-	-	⊙	-	-
Seed production	⊙	-	○	○	-	⊙
Nursery & Fattening	○	-	⊙	○	-	⊙
Extension of the farming techniques	⊙	-	○	⊙	-	○
Fish Diseases Control						
Disease diagnose	⊙	○	-	○	⊙	-
Disease prevention	⊙	○	-	○	⊙	-
Training for fish farmers		⊙	-		⊙	-
Organizing the Artisanal Fishermen						
Training the farming techniques	⊙	-	-	⊙	-	○
Training the management techniques	-	⊙	-	-	⊙	-
Monitoring & evaluation of the project	-	⊙	-	-	⊙	-

Table 4.2.2 Necessary Projects for Mariculture and Brackish water Pond Culture in NTB and NTT (1/2)

District	Initial Stage	Later Stage
Lombok Island	<ul style="list-style-type: none"> • Establish grouper seed production technology at Lombok Aquaculture Station. • Strengthen fish disease testing and prevention functions of Lombok Aquaculture Station. • Set up a fish disease testing and prevention network. • Create a model of aquaculture cooperative operations (seaweed, prawns, and milk fish). 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Conduct grouper culture technology extension. • Strengthen disease prevention functions of the district Fisheries Office. • Formulate aquaculture development plan for small-scale fishers.
Sumbawa District	<ul style="list-style-type: none"> • Establish calculation method on potential aquaculture development in the model district. • Establish system of aquaculture related laws and regulations. • Conduct technology transfer activities in grouper culture technology (priority species, tiger grouper) • Establish fish disease testing and prevention network. • Create a model of aquaculture cooperative operations (seaweed, prawns) 	<ul style="list-style-type: none"> • Formulate goals in aquaculture development. • Strengthen disease prevention functions of the district Fisheries Office. • Conduct extension activities in grouper culture technology. • Formulate aquaculture development plan for small-scale fishers.
Bima District	<ul style="list-style-type: none"> • Conduct technical transfer activities in grouper culture technology. • Create a model aquaculture cooperative operation (seaweed, prawns, and groupers). 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Conduct extension activities in grouper culture technology. • Formulate aquaculture development plan for small-scale fishers. • Strengthen disease prevention functions of the district Fisheries Office.
Dompu District	<ul style="list-style-type: none"> • Develop fertilization culture for milk fish. • Establish fish disease testing and prevention network. • Create a model of aquaculture cooperative operations (seaweed, prawns, milk fish). 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Conduct extension activities in grouper culture technology. • Formulate aquaculture development plan for small-scale fishers. • Strengthen disease prevention functions of the district Fisheries Office.

Table 4.2.2 Necessary Projects for Mariculture and Brackish water Pond Culture in NTB and NTT (2/2)

District	Initial Stage	Later Stage
West Sumbawa District East Sumbawa District	<ul style="list-style-type: none"> • Create a model of aquaculture cooperative operations (milkfish). • Develop fertilization culture for milk fish. 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Formulate aquaculture development plan for small-scale fishers. • Establish disease prevention network.
Manggarai District	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development • Establish system of aquaculture related laws and regulations. • Create a model of aquaculture cooperative operations (milkfish). • Develop fertilization culture for milk fish. 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Formulate aquaculture development plan for small-scale fishers. • Establish disease prevention network. • Conduct extension activities in grouper culture technology.
Ngada District Ende District Sikka District	<ul style="list-style-type: none"> • Create a model of aquaculture cooperative operations (milkfish). • Develop fertilization culture for milk fish. 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Formulate aquaculture development plan for small-scale fishers. • Establish disease prevention network. • Conduct extension activities in grouper culture technology.
East Flores District Sumbawa District Flores District	<ul style="list-style-type: none"> • Conduct extension activities in grouper culture technology. • Create a model of aquaculture cooperative operations (milkfish, seaweed, grouper). 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Formulate aquaculture development plan for small-scale fishers. • Establish disease prevention network. • Conduct extension activities in grouper culture technology.
Kupang (2 islands)	<ul style="list-style-type: none"> • Create a model of aquaculture cooperative operations (milkfish) 	<ul style="list-style-type: none"> • Introduce calculation method on potential aquaculture development and system of aquaculture related laws and regulations. • Formulate goals in aquaculture development. • Formulate aquaculture development plan for small-scale fishers.

Table 4.6.1 Strengthening Approach and Achievement Target for Fishermen Organization (1/3)

Items	Existing Situation and Issues	Strengthening Approach	Achievement Target
Organization structure and cooperative spirit	<ul style="list-style-type: none"> - Necessary legal framework in place for setting up and operation of fisheries cooperatives - Low membership and lack of support from fisherfolks themselves due to lack of awareness and understanding of the function and benefits 	<p>Raise awareness and demonstrate benefits of cooperative activities.</p> <ul style="list-style-type: none"> - Open dialogue and discussion using audio-visual materials, pre-prepared charts, handouts, leaflets, etc. - Invite leaders and members of successful cooperatives to speak on the activities and benefits - Study tour and exposure of selected members to well organized & operated organizations. 	<ul style="list-style-type: none"> - Active participation and increase in membership. - Realization that activities must emerge from their own needs to resolve problems. - Change in mind-set from dependency to independency (self-reliance)
Human resource and management - Leadership and overall management - Management and implementation of activities	<p>Leader can not fulfill his role due to:</p> <ul style="list-style-type: none"> - Fishing - Lack leadership capability - Low management capacity to administer and organize activities -Lack of management skill and experience; cannot manage TPI on their own including fish landing, supply of fuel, ice, etc. 	<p>Employ a capable local resident as a “mover and facilitator” for day-to-day administration and management of the cooperative, and pay his salary. He will be given OJT in management, accounting and record keeping. His role will be:</p> <ul style="list-style-type: none"> - Overall management of coop. - Organize and implement economic activities - Control all aspects of activities including collection of user fee, recording, etc. 	<ul style="list-style-type: none"> - Achievement of members with skills and ability to identify their weakness and needs, and to resolve their problems. - Community’s achievement in self-reliance to serve a model for dissemination to non-active cooperatives.
Financial base	<ul style="list-style-type: none"> - Weak financial base that depends solely on members contribution and government subsidies - None or limited economic activities to generate revenue. 	<ol style="list-style-type: none"> 1) Formulate a method for collecting membership fee and contributions from sales for mutual saving fund. 2) Teach simple accounts and accounting procedures to cashier, leader, leaders of user groups. 2) Collect user charges for use of facilities. 3) Generate revenue from sales of fish, fuel, ice, etc. 	<ul style="list-style-type: none"> - Achieve internal fund (savings) reserves to finance credit operation, investment and non-profit social services. - Gain creditworthiness and credibility of private finance sources.

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Table 4.6.1 Strengthening Approach and Achievement Target for Fishermen Organization (2/3)

	Existing Situation and Issues	Strengthening Approach	Achievement Target
<p>Activities</p> <ul style="list-style-type: none"> - Credit - Technical - Service 	<p><u>Credit</u></p> <ul style="list-style-type: none"> - Low internal fund for credit operation - Current credit activity depends on government subsidies - No creditworthiness from banks <p><u>Technical</u></p> <ul style="list-style-type: none"> - Very limited support to acquire new or better techniques - Lack of govt. fund or their savings to acquire new technology - Inadequate technical support from extension service <p><u>Service</u></p> <p>Lack of competitive services such as below:</p> <ul style="list-style-type: none"> - Transport for marketing - Ice (Limited ice supply and high price) - Fuel, fishing gears, etc. (available away from fishing village) <p>As a result post-harvest loss is relatively high; 50-75% of fresh fish are processed and 20% drop in price of fresh fish</p>	<ol style="list-style-type: none"> 1) Increase group savings to raise the creditworthiness of the group to access private financial sources 2) Assist in getting credits for viable operations 3) Assigned a full-time fisheries officer to arrange and introduce new or better techniques; members will be encouraged to pay accordingly. 4) A frequent visit of extension officer is encouraged, as it will be learning process for him. 5) Increase competitive services by: <ul style="list-style-type: none"> - Cooperative marketing on behalf of members (consignment basis). - Cooperative supply (engage in supplying members with gear, fuel, ice, daily living necessities). - Cooperative use of fish transport to local market. 	<ul style="list-style-type: none"> - Activities to emerge from their needs; viable activities integrated with marketing, credit and extension under strong & competent management. - Achieve internal fund (savings) reserves to finance credit operation, investment and non-profit social services. - Gain creditworthiness of private finance sources. - Open bank account and savings; members, cashier, leaders understand simple accounts and accounting procedures. - Independent acquisition of appropriate techniques without the assistance of government - Achieve better bargaining position and better price
<p>Management of facilities and infrastructure</p>	<ul style="list-style-type: none"> - No experience and skill to operate and manage TPI including landing, marketing facilities on their own. 	<ol style="list-style-type: none"> 1) Common-use facilities for the members to be responsible in O/M. 2) Formulate O/M guidelines and train the users. 3) Members pay a fee for use of the facilities; collected fee to be used for O/M expenses. 	<ul style="list-style-type: none"> - Achieve a sense of responsibility and ownership of the common-use facilities and effective usage for their benefits.

Table 4.6.1 Strengthening Approach and Achievement Target for Fishermen Organization (3/3)

	Existing Situation and Issues	Strengthening Approach	Achievement Target
Guidance and monitoring by government	<ul style="list-style-type: none"> - Lack of contact (out of touch) or support by relevant government officers - Low skill or management capacity of district and provincial fisheries officers - Inadequate practical training in PM&E of officers 	<ol style="list-style-type: none"> 1) Set up a section for social / community development in district fisheries office to cater the needs of community. 2) Assign a full-time officer and he will be a link between the community and fisheries office. 3) He will teach and guide the members in recording of daily fish catch landing. 4) He will arrange and provide necessary information to the members. 5) He will monitor and evaluate, and prepare record on the community activities. 6) He will also be learning and gaining experience in management and extension practices (OJT). 7) The community will pay a monthly allowance as incentive for his active participation. 	<ul style="list-style-type: none"> - Experience gained and successful coordination in strengthening of a fishers cooperative to a self-reliant body by the district fisheries office are to be disseminated to non-active organizations. - Records of fish landing are to be used in planning of resource management. - Periodic monitoring and evaluation of the community activities is to be used by relevant agencies and banks to appraise credit and loan applications.

Table 4.6.2 Expected Role and Recommendation of Relevant Institutions for Strengthening of Fishermen Organization (1/2)

Main Institutions		Expected Role & Recommendation
1	Provincial Fisheries Office	<ol style="list-style-type: none"> 1. Coordinate and arrange the needs of the stakeholders with the related institutions at local and national level activities of district fisheries office, such as regional training and extension centers, development banks, NGOs, etc. 2. Impart formal training needs of the full-time officer assigned to the community that is necessary for carrying out his tasks among the stakeholders.
2	District Fisheries Office	<ol style="list-style-type: none"> 1. Participate actively to strengthen human resource, improve skill and knowledge oriented towards learning and entrepreneurial skill (leadership capability) in order to foster self-reliance activities. 2. Assign an officer on a full-time basis. 3. Provide necessary formal education and training to the assigned officer in data collection, marketing aspects, etc. 4. Duties of the officer are: <ul style="list-style-type: none"> - to train the fishermen in recording of daily fish catch - to supervise, monitor and evaluate the activities of the community - to arrange the formal and informal training needs of the stakeholders 5. Maintain a proper record on the activities and fish catch data. 6. Share relevant information & data with fisheries institutions to formulate training needs of stakeholders and with financial institutions to recommend and appraise loans/credits. 7. Fisheries Office will be the owner of both the basic and functional facilities provided in the project but it will be only responsible for the O/M of the basic facilities. 8. It is recommended that a section for fishermen cooperative/organization & community development be established within the Dinas to undertake appropriate tasks.
3	District Cooperative Office	<ol style="list-style-type: none"> 1. Cooperative Office will mobilize the stakeholders and raise the understanding on the true cooperation spirit; instill awareness of the benefits and opportunities of active participation in a community based approach and mutual cooperation. 2. Recommend and appraise loan and credit requests of stakeholders based on the data and information prepared by District Fisheries Office.
4	Relevant Fisheries Institutions	<p>Fisheries institutions (training and extension centers) will assist in providing formal training to selected stakeholders as well as to fisheries officer assigned to the community.</p>

Table 4.6.2 Expected Role and Recommendation of Relevant Institutions for Strengthening of Fishermen Organization (2/2)

Main Institutions		Expected Role & Recommendation
5	Development Banks	Local development banks will work closely with district fisheries office and district cooperative office to arrange and provide necessary loans and credits based on their advice and recommendation.
6	NGOs	Assistance of NGOs having experience in cooperatives and community based organizations will be sought to strengthen capacity building of stakeholders, to provide informal education, etc. to improve community living and working facilities such as water supply, sanitary, garbage disposal, etc.
7	MFAF	<i>MMAF is recommended to play the following role in the project.</i> <ul style="list-style-type: none"> - To coordinate and arrange with relevant fisheries institutions the service required for strengthening the fishermen cooperative. - To allocate adequate fund to the cooperatives as launching fund for initial operation of facilities, activities, and credits. This launching fund should serve as revolving fund for the community. - To supervise, monitor and evaluate the activities of the community.
8	The Community (Stakeholders)	<ol style="list-style-type: none"> 1. Community must have clear set of objectives and priorities 2. Clear leadership – leader must provide meaningful commitment sustained throughout the program. 3. Active participation of the community members – should be consultative and meaningful involvement of all stakeholders. Activities must emerge from the stakeholder needs. 4. All stakeholders must be aware of and understand the development activities, the expected changes, capacity needs (Stakeholders need strong internal and external communication) 5. Must not be any hidden agenda; all decision making must be transparent. (Open dialogues). 6. Collaborative management of the community facilities; operation and management of functional facilities entrusted to fishermen. O/M training must be provided. 7. Activities (marketing and economic) must emerge or be initiated from the stakeholders needs. Form user or core groups for various economic activities. 8. Employ competent personnel from private sector to manage initially and gradually transfer management to trained fishermen with leadership attributes. 9. Members pay for the usage fees of facilities and fish landing fees that will be used to cover the O/M expenditure of facilities as well as salaries of employed staff and incentive payment for full-time fisheries officer.
9	Competent Hired Employee	<ol style="list-style-type: none"> 1. The hired competent person experienced in management and business/entrepreneurial skill will be responsible for the overall management of the organization, and he will teach and transfer gradually the know-how of day-to-day operation and management of economic activities. 3. The cooperative must pay his salaries and provide incentives in the form of bonuses for active participation.

Table 4.7.1 Education and Training Plan for the Proposed Master Plan (1/3)

Draft Master Plan	Contents	Activities	Education/Training	Target Groups
Improvement Plan of Fishermen Organization and Fisheries Extension	<ul style="list-style-type: none"> - Plan to strengthen the fishermen organization - Plan to develop and strengthen economic activities - Plan to establish revolving fund - Plan to improve extension services 	<ul style="list-style-type: none"> - Mobilize and strengthen the organization for an effective and sustainable administration and management system - Educate and strengthen on the need for community-based approach and its benefits - Promote and encourage economic activities such as fish marketing, sales of fuel & ice, etc. - Promote sense of ownership and responsibility of the facilities/equipment - Promote and encourage mutual savings & credit to offset the shortage of fund for operation and investment - Establish a well-equipped extension section in the fisheries departments - Increase the skills and knowledge of extension workers including in planning, formulating and extension services 	<ul style="list-style-type: none"> - Impart OJT leadership training of capable cooperative members as well as expose them to well organized and operated organizations - Educate the leaders on the administrative and managerial skill - Raise the understanding of issues in fisheries as well as the awareness of Govt's role in fisheries - Educate on the benefits of resource management and conservation - Educate members on business management skill (bookkeeping, accounting) - Training on O/M of facilities - Educate the concept and benefit of savings and revolving fund - For extension workers educate on the general matters of fisheries (data collection, fish production, marketing, processing, etc.) and provide relevant training in selected fisheries institutions - Provide training in extension methods including preparing of extension materials 	Fisheries cooperative members, district fisheries staff members

Table 4.7.1: Education and Training Plan For the Proposed Master Plan (2/3)

Draft Master Plan	Contents	Activities	Education/Training	Target Groups
Improvement Plan of Fishing Technology and Coastal Resources Management	<ul style="list-style-type: none"> - Diversification of fishing grounds (to offshore and under exploited coastal waters) - Control of fishing activities in coastal waters, and community management of coastal resources and fishing grounds - Improvement of fisheries data collection 	<ul style="list-style-type: none"> - Motorization of fishing boats and development of new fishing techniques for pelagic and demersal fisheries - Community based overall surveillance system - Fishing licensing system - Control of illegal fishing - Daily recording of fish landing and marketing activities 	<ul style="list-style-type: none"> - Experienced fishermen to be recruited for short term and OJT for young fishermen - Practical training on repair and maintenance of engines, etc. - Education on the benefits of resource management and conservation/appropriate utilization, on the fisheries regulations, on the damages by destructive fishing methods - OJT with the assistance of fisheries staff 	<p>Small-scale fishermen and district fisheries staff</p> <p>Fishermen</p> <p>Fishermen and fisheries staff</p> <p>Fishermen</p>
Improvement Plan of Fish Marketing and Processing	<ul style="list-style-type: none"> - Plan to improve fresh fish marketing (on board, landing & transport) - Plan to improve fish processing including development of new fish products - Plan to improve fish transport and communication network 	<ul style="list-style-type: none"> - Fish handling and storing during fishing, landing and marketing, on the use of ice, awareness on sanitary and hygiene, etc. - Improve environment, processing & packing methods to enhance quality - Introduce new products using other fish species - Communal use of transport - Set up communication network to disseminate marketing information to diversification of markets 	<ul style="list-style-type: none"> - Practical training on handling and preservation - Use of pamphlets and handouts on handling and preservation - Education on sanitary and hygiene - Observation of a good working cooperative 	<p>Fishermen, fisher women, fisheries staff</p>

Table 4.7.1: Education and Training Plan For the Proposed Master Plan (3/3)

Draft Master Plan	Contents	Activities	Education/Training	Target Groups
Improvement Plan of Fisheries Infrastructure	<ul style="list-style-type: none"> - Plan to establish supporting infrastructure and facilities to achieve effective fish landing, marketing, processing, etc. - Rehabilitation of existing PPI - Improvement of sanitation to maintain fish quality - Develop and strengthen O/M system 	<ul style="list-style-type: none"> - Provision of mooring, landing, repairing facilities - Rehabilitate the facilities to activate effective use by small fishing boats - Provision of drainage, garbage, water, ice making facilities - Basic facilities are managed by the fisheries office and the functional facilities are to be operated, managed and maintained by the fisher community 	<ul style="list-style-type: none"> - Promote sense of ownership and responsibility of the facilities & equipment - O/M training of the facilities & equipment - Encourage the users to formulate O/M system 	Fishermen, fisher women, fisheries officers
Improvement Plan of Fishing Village Environment	<ul style="list-style-type: none"> - Plan to improve the village working and living environment to support fisheries activities - Plan to create and foster awareness for community oriented self-reliance and independency 	<ul style="list-style-type: none"> - Secure adequate space for fishery activities and community activities - Build access roads, water supply, drainage, garbage disposal, etc. 	<ul style="list-style-type: none"> - Raise awareness of sanitary and hygiene in the community - Instill responsibility for periodical cleaning and maintenance of community facilities - Raise the community's awareness on the role of mutual cooperation and its benefits 	Fishermen, fisher women, whole community
Improvement Plan of Aquaculture Technology	<ul style="list-style-type: none"> - Plan to estimate potential area for aquaculture - Plan to establish extension system for aquaculture techniques - Plan to establish fish disease prevention system - Plan to organize and strengthen the fish farmers 	<ul style="list-style-type: none"> - Formulate method to estimate potential area including the essential parameters and relevant regulations for aquaculture - Formulate extension approach and method for hatchery, nursery, grow-out techniques - Develop and strengthen a system for disease investigation, prevention and treatment. - Develop a management model for fish farmers 	<ul style="list-style-type: none"> - Educate and demonstrate the estimation methods - Provide short-term training in established aquaculture centers and farms to selected fish farmers on pond ecosystem, management measures on breeding, nursing and rearing, disease identification and prevention 	Extension workers, fisheries officers, fish farmers

Table 6.3.1 Screening Checksheet

Type of activities	Environmental resources				Physical resources				Ecological resources				Human use values				Quality of life values																							
	Surface water hydrology	Surface water quality	Ground water hydrology	Ground water quality	Climate	Air Quality	Land quality: pollution	Mineral resources	Geology/seismology	Marine/ Beach / Estuarine	Fisheries	Aquatic biology	Forests/vegetative cover	Terrestrial wildlife	Endangered species	Fisheries Industry	Fisheries processing	Road/railway	Navigation	Water supply	Electricity supply	Agriculture	Housing	Recreation	Land use	Flood control	Sewage disposal	Solid waste disposal	Human ecology/ use	Resettlement	Public Health	Public safety	Economic and social struct	Institutional / Social org	Historical / Special inter	Archaeological	Recreation	Aesthetics		
FISHING ACTIVITIES																																								
- Improve fishing technique																																								
- Improve fishing net/gear																																								
- Improve navigation aid																																								
- Improve communication system																																								
LAND ACTIVITIES																																								
- Improve fish landing jetty																																								
- Improve sanitation of processing area																																								
- Improve fish landing area																																								
- Improve fish market																																								
- Improve fuel depot																																								
- Improve fish gear shop/ kiosk																																								
- Improve net loft (store/drying/repairing)																																								
- Improve workshop																																								
- Improve fish distribution																																								
- Improve processing quality																																								
- Diversification of fisheries products																																								
- Ice plant																																								
- Insulated box																																								
- Improve water supply																																								
- Improve sanitation																																								
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- Improve village environment																																								
- Improve training/education system																																								

Notes:

(i) Numbers indicate magnitude of significant impacts: 3=major, 2=intermediate, 1=slight

(ii) Positive numbers indicate positive impact, negative numbers indicate negative or adverse impact