

Table 2.2-2-5 Changes of Production, Import, Consumption of Livestock Products in Cote d'Ivoire

Year	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
Population (1000)	6,700	8,260	8,430	8,800	9,200	9,700	10,100	10,400	10,700	10,999	11,187	11,588	12,004	12,435	12,882	13,344	13,823	14,319	14,834	15,368	6,700	13,400	
Growth rate (%)		23.3%	2.1%	4.4%	4.5%	5.4%	4.1%	3.0%	2.9%	0.9%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	3.6%	9.758	3.4%	
Meat																							
National Production (t)																							
Cattle	6,300	12,100	11,620	12,201	12,811	13,452	14,300	14,690	15,200	15,630	16,457	17,664	18,490	19,036	19,501	19,791	20,291	20,818	21,367	21,943	6,300	16,9%	19,878
Sheep & Goat	3,580	4,430	4,500	4,631	4,723	4,818	5,000	5,140	5,280	5,400	5,530	5,620	5,750	5,890	6,038	6,189	6,345	6,502	6,664	6,832	3,580	35.9%	6,203
Porks	4,600	5,930	6,160	6,283	6,409	6,450	6,500	6,700	7,010	7,180	7,190	7,250	7,488	7,735	7,969	8,198	8,421	8,645	8,870	9,100	4,600	99.6%	6,581
Poultry	8,500	13,240	14,500	15,298	16,139	17,028	17,310	18,320	19,020	18,380	18,380	18,850	19,589	20,000	21,000	18,711	19,176	23,036	23,431	22,916	8,500	47.6%	20,745
Total	22,980	35,700	36,780	38,413	40,082	41,748	43,110	44,850	46,590	47,557	49,384	51,317	52,661	54,508	52,419	53,762	56,847	56,447	56,815	52,980	33.0%	42,134	51.0%
Import (t)																							
Cattle	30,900	51,268	48,700	49,334	49,978	50,633	57,000	63,970	60,800	64,250	50,736	54,760	50,246	42,847	40,242	40,776	37,026	35,956	34,918	36,976	30,900	83.1%	54,667
Sheep & Goat	6,400	7,172	7,620	7,705	7,791	7,879	5,980	6,570	6,910	6,430	6,561	5,932	5,625	5,162	4,337	4,828	6,213	8,105	4,705	5,045	6,400	64.1%	7,062
Porks	20	22	230	236	242	248	370	1,100	5,160	9,400	7,718	8,202	3,264	1,910	2,410	1,482	1,254	1,246	218	895	20	0.4%	2,473
Poultry	9,370	2,061	1,840	1,969	1,996	2,026	2,770	3,380	3,820	8,850	7,335	1,762	1,188	1,289	1,568	1,800	2,481	2,528	3,250	4,299	9,370	52.4%	3,605
Total	46,690	60,523	58,390	59,244	60,007	60,786	66,120	75,020	76,690	88,930	72,350	70,656	60,323	51,208	48,557	48,886	46,974	47,835	43,091	47,215	46,690	67.0%	67,806
Total (t)																							
Cattle	37,200	63,368	60,320	61,535	62,789	64,085	71,300	78,660	76,000	79,880	67,193	72,424	68,736	61,883	59,743	60,567	57,317	56,774	56,285	58,919	37,200	53.4%	68,513
Sheep & Goat	9,980	11,602	12,120	12,336	12,514	12,697	10,980	11,710	12,190	11,830	12,091	11,552	11,375	11,017	12,558	14,607	11,369	11,877	9,980	14,3%	12,007	10.9%	11,754
Porks	4,620	5,952	6,390	6,519	6,651	6,698	6,870	7,800	12,170	16,580	14,908	15,452	10,752	9,645	10,379	9,210	9,204	7,737	5,203	6,019	4,620	6.6%	9,054
Poultry	17,870	15,301	16,340	17,267	18,135	19,054	20,080	21,700	22,840	25,715	20,612	20,777	21,289	22,368	20,511	21,657	25,564	26,681	27,215	17,870	25.6%	20,366	21.8%
Total	69,670	95,223	95,170	97,657	100,089	102,534	109,230	119,870	123,200	135,520	119,907	120,040	111,640	103,869	103,065	101,305	100,736	104,682	99,538	104,030	69,670	100.0%	109,940
Consumption (kg/hab/yr)																							
Cattle	5.6	7.7	7.2	7.0	6.8	6.6	7.1	7.6	7.1	7.4	6.0	6.2	5.7	5.0	4.6	4.5	4.1	4.0	3.8	3.8	5.6	53.8%	7.1
Sheep & Goat	1.5	1.4	1.4	1.4	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.0	0.9	0.8	0.8	0.7	0.9	1.0	0.8	0.8	1.5	14.4%	1.2
Porks	0.7	0.7	0.8	0.7	0.7	0.7	0.8	1.1	1.5	1.3	1.3	1.3	0.9	0.8	0.7	0.5	0.4	0.4	0.4	0.4	0.7	6.7%	0.9
Poultry	2.7	1.9	1.9	2.0	2.0	2.0	2.0	2.1	2.1	2.5	2.3	1.8	1.7	1.7	1.8	1.5	1.6	1.8	1.8	2.7	26.0%	2.1	
Total	10.4	11.6	11.3	11.1	10.9	10.6	10.8	11.5	11.5	12.5	10.7	10.4	9.3	8.4	8.0	7.6	7.3	7.3	6.7	6.8	10.4	100.0%	11.3
Milk (t)																							
Production	6,000	11,700	12,292	12,600	12,915	16,000	15,500	16,000	17,200	17,500	17,200	17,500	19,000	20,000	21,179	21,632	22,102	22,591	23,097	23,639	6,000	7.3%	14,370
Import	76,000	120,000	125,000	122,895	125,767	125,452	232,700	247,600	317,600	274,800	215,452	182,415	216,982	137,825	137,825	92,134	139,781	156,579	156,426	173,584	76,000	92.7%	190,727
Total	82,000	131,700	136,993	138,187	138,367	138,367	248,700	263,100	333,600	292,000	232,952	200,215	235,982	157,825	159,004	113,766	161,883	179,170	179,523	197,223	82,000	100.0%	205,097
Eggs (t)	12.2	15.9	16.3	15.4	15.0	14.3	24.6	25.3	31.2	27.0	20.8	17.3	19.7	12.7	12.3	8.5	11.7	12.5	12.1	12.8	12.2	12.2	13.3
Eggs (t)																							
Production	3,800	9,110	12,440	12,100	11,500	12,500	12,980	12,400	13,870	15,160	13,630	11,694	13,821	12,563	16,226	15,986	16,068	38,218	36,406	37,568	3,800	3.800	12,569
Import	0.57	1.10	1.48	1.38	1.25	1.29	1.29	1.19	1.30	1.40	1.22	1.01	1.15	1.01	1.26	1.20	1.16	2.67	2.45	2.44	0.57	0.57	1.3
Total	4.37	10.21	13.92	13.48	12.75	13.79	14.27	14.17	15.17	15.06	15.05	12.70	14.97	13.57	17.49	17.18	17.23	40.88	38.85	40.01	4.37	4.37	22,061

(Source) Statistiques Agricoles 1998, Direction de la Programmation, MINAGRA

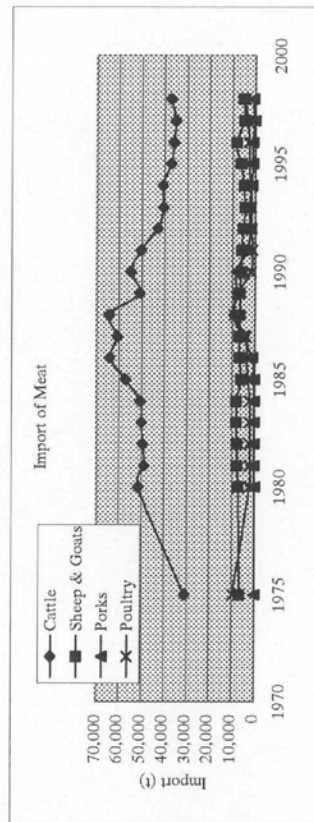
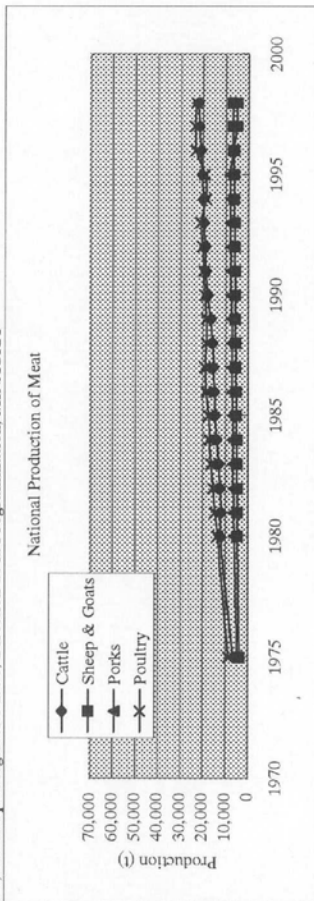


Table 2.2-2-6 Number of Livestock, Livestock Holdings and Grazing Density by Department in 1995

Region	Department	Area (km2)	Agri. House holds	Number of Livestock				Holdings (heads/household)				Grazing Density	
				Cattle (heads)	Sheep & Goats (heads)	Pigs (heads)	Poultry (heads)	Cattle	Sheep & Goats	Pigs	Poultry	Necessary Area (km2)	Ratio to Total Area
1 Agneby	5 Adzope	5,218	17,376	2,310	49,380	80	440	0.13	2.84	0.00	25	127	2.4%
1 Agneby	6 Agboville	3,887	23,161	890	44,640	100	550	0.04	1.93	0.00	24	100	2.6%
2 Bas Sassandra	43 San-Pedro	6,848	45,034	2,290	20,360	0	990	0.05	0.45	0.00	22	68	1.0%
2 Bas Sassandra	44 Sassandra	4,966	27,144	720	25,300	5,780	650	0.03	0.93	0.21	24	71	1.4%
2 Bas Sassandra	47 Soubre	8,540	68,454	1,370	35,170	0	1,790	0.02	0.51	0.00	26	87	1.0%
2 Bas Sassandra	48 Tabou	5,851	18,626	720	9,670	0	370	0.04	0.52	0.00	20	28	0.5%
3 Denguele	40 Odienne	20,892	14,161	53,790	91,540	260	470	3.80	6.46	0.02	33	829	4.0%
4 Haut-Sassandra	21 Daloa	5,388	36,978	4,350	24,690	18,760	1,070	0.12	0.67	0.51	29	139	2.6%
4 Haut-Sassandra	28 Gagnoa	4,545	35,752	1,500	26,340	40,360	830	0.04	0.74	1.13	23	151	3.3%
4 Haut-Sassandra	32 Issia	3,722	23,216	370	17,080	0	640	0.02	0.74	0.00	28	39	1.0%
4 Haut-Sassandra	56 Vavoua	6,228	29,820	2,510	23,870	0	890	0.08	0.80	0.00	30	78	1.3%
5 Lacs	52 Tiebissou	2,307	7,203	2,240	32,670	130	190	0.31	4.54	0.02	26	92	4.0%
5 Lacs	55 Toumodi	2,698	7,304	12,400	34,560	0	180	1.70	4.73	0.00	25	218	8.1%
5 Lacs	571 Yamoussoukro1	2,108	6,964	1,980	28,810	110	170	0.28	4.14	0.02	24	82	3.9%
5 Lacs	572 Yamoussoukro2	1,698	9,305	2,880	42,000	170	240	0.31	4.51	0.02	26	119	7.0%
6 Lagunes	2 Abidjan	2,702	14,788	3,430	11,710	52,390	250	0.23	0.79	3.54	17	169	6.3%
6 Lagunes	8 Alepe	2,176	15,250	4,130	14,090	63,040	300	0.27	0.92	4.13	20	204	9.4%
6 Lagunes	20 Dabou	2,195	18,783	5,030	17,170	76,840	360	0.27	0.91	4.09	19	248	11.3%
6 Lagunes	30 Grand Lahou	2,036	10,257	960	8,230	0	230	0.09	0.80	0.00	22	28	1.4%
6 Lagunes	33 Jacquerville	745	2,836	780	2,650	11,850	60	0.28	0.93	4.18	21	38	5.1%
6 Lagunes	51 Tiassale	3,442	18,105	1,710	33,950	310	450	0.09	1.88	0.02	25	89	2.6%
7 Marahoue	15 Bouaflé	4,185	20,361	2,920	51,440	14,580	540	0.14	2.53	0.72	27	167	4.0%
7 Marahoue	41 Oume	2,358	14,303	930	35,590	30	400	0.07	2.49	0.00	28	82	3.5%
7 Marahoue	46 Sinfra	1,643	14,037	480	17,900	0	410	0.03	1.28	0.00	29	42	2.6%
7 Marahoue	58 Zuenoula	2,938	15,592	2,530	64,400	2,040	380	0.16	4.13	0.13	24	163	5.5%
8 Montagnes	9 Bangolo	2,127	17,941	110	12,970	0	410	0.01	0.72	0.00	23	27	1.3%
8 Montagnes	11 Biankouma	5,020	12,664	1,590	13,790	480	270	0.13	1.09	0.04	21	48	1.0%
8 Montagnes	22 Danane	4,601	32,978	540	21,400	0	720	0.02	0.65	0.00	22	49	1.1%
8 Montagnes	26 Duekoue	3,017	17,342	60	6,170	0	430	0.00	0.36	0.00	25	13	0.4%
8 Montagnes	31 Guigio	10,557	23,406	320	17,140	380	540	0.01	0.73	0.02	23	39	0.4%
8 Montagnes	37 Man	4,808	26,429	830	20,990	2,730	570	0.03	0.79	0.10	22	57	1.2%
8 Montagnes	54 Toulepleu	811	4,800	60	3,440	80	110	0.01	0.72	0.02	23	8	1.0%
9 Moyen-Comoe	1 Abengourou	5,143	29,301	6,250	35,370	1,930	660	0.21	1.21	0.07	23	150	2.9%
9 Moyen-Comoe	7 Agribilekrou	1,853	10,509	1,250	22,830	0	250	0.12	2.17	0.00	24	61	3.3%
10 N'zi-Comoe	12 Bocanda	3,262	9,929	3,420	38,670	2,260	240	0.34	3.89	0.23	24	123	3.8%
10 N'zi-Comoe	14 Bongouanou	5,593	18,981	2,330	30,240	1,780	530	0.12	1.59	0.09	28	92	1.6%
10 N'zi-Comoe	23 Daoukro	3,958	6,925	1,840	49,580	0	160	0.27	7.16	0.00	23	121	3.1%
10 N'zi-Comoe	24 Dimbokro	1,564	3,619	1,110	12,560	740	80	0.31	3.47	0.20	22	40	2.6%
10 N'zi-Comoe	39 M'bahiakro	5,220	12,254	7,560	55,970	0	320	0.62	4.57	0.00	26	203	3.9%
11 Savanes	18 Boundiali	7,956	13,453	164,470	55,750	0	390	12.23	4.14	0.00	29	2,085	26.2%
11 Savanes	27 Ferkeskedougou	17,224	20,560	317,420	106,970	6,240	560	15.44	5.20	0.30	27	4,035	23.4%
11 Savanes	35 Kenhogo	12,696	39,489	341,520	144,600	27,840	780	8.65	3.66	0.71	20	4,443	35.0%
11 Savanes	50 Tengrela	2,270	3,363	93,990	38,470	410	120	27.95	11.44	0.12	36	1,206	53.1%
12 Sud Bandama	25 Divo	8,139	50,640	3,510	32,300	3,820	1,310	0.07	0.64	0.08	26	114	1.4%
12 Sud Bandama	36 Lakota	2,734	18,533	1,410	10,080	6,820	410	0.08	0.54	0.37	22	51	1.9%
13 Sud Comoe	3 Aboisso	4,474	29,231	1,010	24,050	0	610	0.03	0.82	0.00	21	60	1.3%
13 Sud Comoe	4 Adiake	1,714	13,335	450	10,720	0	270	0.03	0.80	0.00	20	27	1.6%
13 Sud Comoe	29 Grand Bassam	1,426	7,839	1,880	6,430	28,750	140	0.24	0.82	3.67	18	93	6.5%
14 Vallee du Bandama	10 Beoumi	2,609	12,523	7,020	40,950	0	280	0.56	3.27	0.00	22	166	6.4%
14 Vallee du Bandama	16 Bouake	4,709	9,883	18,880	84,360	22,270	230	1.91	8.54	2.25	23	440	9.3%
14 Vallee du Bandama	19 Dabakala	9,761	13,130	20,950	103,090	0	250	1.60	7.85	0.00	19	458	4.7%
14 Vallee du Bandama	34 Katiola	9,440	11,957	49,070	24,690	280	220	4.10	2.06	0.02	18	639	6.8%
14 Vallee du Bandama	42 Sakassou	1,874	6,348	3,320	16,050	100	140	0.52	2.53	0.02	22	72	3.8%
15 Worodougou	38 Mankono	10,603	20,604	9,720	27,360	0	540	0.47	1.33	0.00	26	171	1.6%
15 Worodougou	45 Seguela	11,460	12,717	6,310	64,600	0	320	0.50	5.08	0.00	25	205	1.8%
15 Worodougou	53 Touba	8,707	13,756	5,180	28,800	100	330	0.38	2.09	0.01	24	120	1.4%
16 Zanzan	13 Bondoukou	9,844	43,531	9,770	111,290	5,070	740	0.22	2.56	0.12	17	350	3.6%
16 Zanzan	17 Bouana	21,846	18,702	56,380	135,970	11,500	500	3.01	7.27	0.61	27	972	4.4%
16 Zanzan	49 Tanda	6,390	30,522	5,250	113,140	3,590	570	0.17	3.71	0.12	19	296	4.6%
1 Agneby	1 Agneby	9,105	40,537	3,200	94,020	180	990	0.08	2.32	0.00	24	227	2.5%
2 Bas Sassandra	2 Bas Sassandra	26,205	159,258	5,100	90,500	5,780	3,800	0.03	0.57	0.04	24	254	1.0%
3 Denguele	3 Denguele	20,892	14,161	53,790	91,540	260	470	3.80	6.46	0.02	33	829	4.0%
4 Haut-Sassandra	4 Haut-Sassandra	19,883	125,766	8,730	91,980	59,120	3,430	0.07	0.73	0.47	27	407	2.0%
5 Lacs	5 Lacs	8,811	30,776	19,500	138,040	410	780	0.63	4.49	0.01	25	511	5.8%
6 Lagunes	6 Lagunes	13,296	80,019	16,040	87,800	204,430	1,650	0.20	1.10	2.55	21	777	5.8%
7 Marahoue	7 Marahoue	11,124	64,293	6,860	169,330	16,650	1,730	0.11	2.63	0.26	27	454	4.1%
8 Montagnes	8 Montagnes	30,941	135,560	3,510	95,900	3,670	3,050	0.03	0.71	0.03	22	241	0.8%
9 Moyen-Comoe	9 Moyen-Comoe	6,996	39,810	7,500	58,200	1,930	910	0.19	1.46	0.05	23	210	3.0%
10 N'zi-Comoe	10 N'zi-Comoe	19,597	51,708	16,260	187,020	4,780	1,330	0.31	3.62	0.09	26	579	3.0%
11 Savanes	11 Savanes	40,146	76,865	917,400	345,790	34,490	1,850	11.94	4.50	0.45	24	11,769	29.3%
12 Sud Bandama	12 Sud Bandama	10,873	69,173	4,920	42,380	10,640	1,720	0.07	0.61	0.15	25	165	1.5%
13 Sud Comoe	13 Sud Comoe	7,614	50,405	3,340	41,200	28,750	1,020	0.07	0.82	0.57	20	180	2.4%
14 Vallee du Bandama	14 Vallee du Bandama	28,393	53,841	99,240	269,140	22,650	1,120	1.84	5.00	0.42	21	1,774	6.2%
15 Worodougou	15 Worodougou	30,770	47,077	21,210	120,760	100	1,190	0.45	2.57	0.00	25	496	1.6%
16 Zanzan	16 Zanzan	38,080	92,755	71,400	360,400	20,160	1,810	0.77	3.89	0.22	20	1,618	4.2%
Total	Total	322,365	1,132,004	1,258,000	2,284,000	414,000	26,850	1.11	2.02	0.37	24	20,492	6.4%

Table 2.2-2-7 Livestock Statistic Data by Department

Department	Number of Vaccinated Cattle (heads)				Number of Vaccinated Small Ruminants (heads)				Slaughtering Number of Pigs
	1991	1993	1995	1998	1991	1993	1995	1998	1998
1 Abengourou	3,136	3,738	4,119	4,367	13,639	17,198	17,200	17,500	76
2 Abidjan	8,692	9,274	10,081	18,936	28,399	25,351	25,300	27,400	9,149
3 Aboisso	2,540	2,540	967	1,945	16,824	16,824	16,900	17,600	0
4 Adzope	1,554	1,923	1,528	2,384	19,817	23,901	24,000	25,400	3
5 Agboville	581	938	587	1,249	12,732	21,705	21,700	23,500	4
6 Agnibilekrou	994	1,611	823	1,468	15,840	11,023	11,100	11,500	0
7 Bangolo	95	88	72	42	6,083	6,265	6,300	6,800	0
8 Beoumi	5,285	3,893	4,645	10,073	14,437	19,861	19,900	27,000	0
9 Biankouma	6,103	5,753	1,052	2,351	6,930	6,717	6,700	7,300	19
10 Bondoukou	18,486	15,650	6,466	21,397	49,879	54,129	54,100	64,000	199
11 Bongouanou	-	1,382	1,542	1,373	15,458	14,715	14,700	15,200	70
12 Bouaffle	947	1,774	1,933	11,535	6,332	24,890	25,000	22,500	573
13 Bouake	17,069	17,557	12,489	30,192	27,685	40,898	41,000	27,000	875
14 Bouna	141,510	167,804	37,313	61,854	91,393	66,136	66,100	78,000	452
15 Boundiali	117,950	128,562	108,795	141,249	21,075	27,025	27,100	28,000	0
16 Dabakala	28,054	40,835	13,860	15,591	55,081	50,066	50,100	44,000	0
17 Daloa	1,971	2,538	2,881	2,951	3,135	12,026	12,000	13,400	737
18 Danane	765	1,242	355	135	10,784	10,447	10,400	11,300	0
19 Daoukro	1,125	1,215	1,216	2,053	17,286	24,110	24,100	25,000	0
20 Dimbokro	4,648	2,688	2,993	6,088	37,855	24,839	24,900	25,600	118
21 Divo	1,710	1,869	2,321	2,969	7,515	15,713	15,700	19,500	150
22 Duekoue	78	166	43	181	2,882	3,035	3,000	3,300	0
23 Ferkessedougou	249,110	247,436	209,967	257,504	56,690	51,764	52,000	54,000	245
24 Gagnoa	964	1,218	992	1,557	5,496	12,718	12,800	9,300	1,586
25 Grand Lahou	246	344	633	401	3,313	3,966	4,000	4,600	0
26 Guiglo	328	692	250	150	3,850	9,980	10,000	11,200	18
27 Issia	300	275	248	750	1,441	8,363	8,300	8,200	0
28 Katiola	23,327	27,592	32,460	41,534	25,671	11,675	12,000	42,000	11
29 Korhogo	287,114	307,014	225,901	273,859	91,139	70,280	70,300	79,000	1,094
30 Lakota	349	530	933	1,201	5,422	4,976	4,900	5,200	268
31 Man	659	735	548	279	9,654	10,144	10,200	11,100	107
32 Mankono	20,681	23,848	6,432	36,567	16,665	13,318	13,300	28,000	0
33 M'bahiakro	1,991	3,249	5,003	1,333	20,331	27,223	27,200	21,000	0
34 Odienne	41,871	42,829	35,599	35,443	41,045	44,494	44,500	29,000	10
35 Oume	1,147	1,526	615	1,426	6,872	17,204	17,300	15,300	1
36 Sakassou	-	487	2,195	3,609	7,294	7,725	7,800	8,000	4
37 San-Pedro	538	953	1,506	1,809	3,212	9,868	9,900	14,000	0
38 Sassandra	207	374	477	407	3,805	12,389	12,300	10,000	227
39 Seguela	5,984	6,789	4,174	13,734	30,607	31,314	31,400	31,000	0
40 Sinfra	-	812	321	1,412	0	8,727	8,700	7,700	0
41 Soubre	557	744	906	1,540	3,973	17,033	17,100	19,000	0
42 Tabou	499	702	472	316	1,426	4,799	4,700	5,000	0
43 Tanda	6,097	5,342	3,471	1,510	57,884	55,065	55,000	64,000	141
44 Tengrela	53,596	71,422	62,172	47,117	20,036	19,397	18,700	20,000	16
45 Tiassale	1,199	1,521	1,132	1,125	5,456	16,678	16,500	16,800	12
46 Touba	11,626	13,154	3,427	7,338	13,943	13,949	14,000	14,200	4
47 Toumodi	11,178	13,863	8,200	10,752	16,881	16,783	16,800	17,700	0
48 Vavoua	1,557	1,674	1,659	4,069	10,371	11,696	11,600	11,100	0
49 Yamoussoukro	7,001	7,486	4,694	8,742	12,111	50,236	50,300	52,500	16
50 Zuenoula	1,618	2,416	1,678	4,797	14,366	31,175	31,300	28,500	80
Total	1,093,037	1,198,067	832,146	1,100,664	970,015	1,109,813	1,110,200	1,178,200	16,265

(Source) Agricultural Statistics, 1998 DP, MINAGRA

CHAPTER 3 PRESENT CONDITION OF FISHERY

3.1 General Features of Fishery

Fishery of Cote d'Ivoire is composed of three major fisheries, namely marine, lagoon and inland fisheries. Marine fishery is conducted along the Ivory coast of about 500km length both by industrial large scale fishery and small-scale fishery. On the other hand, lagoon fishery conducted is mostly by small-scale fishermen with a small boat. Inland fishery is composed of natural freshwater fishery and aquaculture. Natural freshwater fishery is conducted by a small boat with net in lakes, reservoirs and rivers like as Buyo and Kossou dams and major rivers. Aquaculture has been recently introduced in inland since a decade and expanded rapidly. On the other hand, lagoon aquaculture was started in earlier stage in an enclosure of lagoon or in a floating cage. Machoiron and tilapia are major species for aquaculture both for inland and lagoon.

Total fish catch is estimated at about 71,600 t in a year as an average from 1993 to 1995. Composition of each sector of fishery is as shown as below:

Table 2.2-3-1 General Features of Fishery in Cote d'Ivoire

Descriptions	Average in 1993-95	Composition (%)	
Population (1000)	13,375		
Marine Fishery (t)	57,858	80.8%	
Large scale fishery	28,027	39.1%	
Small scale fishery	29,831	41.7%	
Inland Fishery (t)	13,740	19.2%	
Inland fisheries	13,472	18.8%	
Lagoon aquaculture	162	0.2%	
Inland aquaculture	106	0.1%	
Grand Total (t)	71,598	100.0%	31.1%
Import (t)	158,762		68.9%
Total Consumption (t)	230,360		100.0%
Percapita Consumption (kg/capita/yr)	17		

(Data Source) Agricultural Statistics 1995 and 1998, DP, MINAGRA

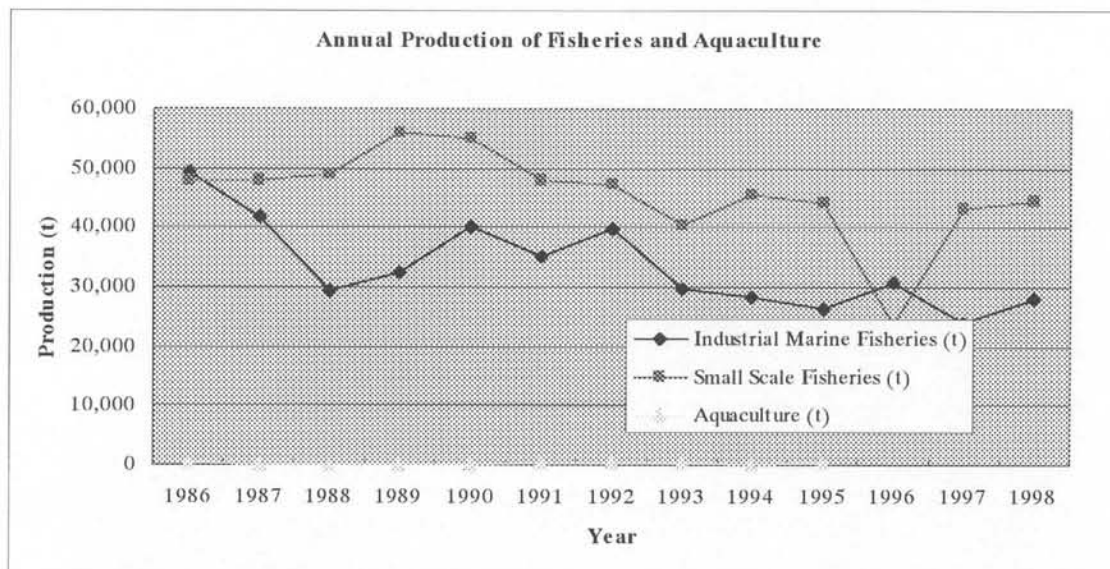
(Note) Details are described in Table 2.2-3-4.

Cote d'Ivoire imports a large amount of fish every year in order to satisfy demand. Total annual import of fish amounts to about 160,000 t, that is about double of production. Per capita consumption of fish is estimated at about 17kg/capita/year.

3.2 Fishery Area and Production

Marine fishery shares a large portion of fish production in the country, which is equivalent to about 80% of total production. However, industrial marine fishery shows the tendency of decrease as shown in Figure 2.2-3-1. Inland freshwater fishery is also in same tendency of decrease.

Figure 2.2-3-1 Production Tendency of Industrial Marine Fishery and Small Scale Fisheries



(A) Freshwater Fishery

There exists at about 3,500 km² of water bodies in inland of Cote d'Ivoire. The principal fishery activities are concentrated in lakes of Kossou (800 km²), Buyo (600 km²), Ayame (160 km²) and Taabo (70 km²) with activities of more than 10,000 fishermen. Total fish production of these lakes and other water bodies is estimated at between 20,000 t and 30,000 t although in decline in tendency. The production concentrates to essentially *tilapia nilotica* species (50 to 70%) and other species like *Chrysichtys (Machoiron)*, *Heterotis*, *Hemichromis*, *Heterobranchus*, *Labeo* and, *Alestes*.etc..

Freshwater fishery has a potentiality of about 200 to 250 Kg/ha/year, but weakness of the means of production limits the level at 30,000 t/year, that is 86.9kg/ha/year.

Table 2.2-3-2 Potential and Production Level of Freshwater Fishery

Water boddies	Surface Area (ha)	Potentiality		Actual Production	
		(t/year)	(kg/ha/yr)	(t/year)	(kg/ha/yr)
Kossou lake	80,000	20,000	250	5,000	62.5
Buyo lake	60,000	15,000	"	8,000	133.3
Ayame lake	16,000	4,000	"	960	60.0
Taabo lake	7,000	1,750	"	650	92.9
Morrisson lake	3,700	925	"	410	110.8
Faye lake	3,000	750	"	180	60.0
Rivers/stream	108,000	26,975	"	1,000	92.6
Other lakes (93)	70,000	17,500	"	5,000	71.4
Total	347,700	86,900	250	30,200	86.9

(Source) Agricultural Master Plan 1992 - 2015

Training of fishermen is getting lax because of the lack of available means in the training facilities.

And progressive invasion of floating plants became very anxious for future fishing due to progressive of entrophication of water. Moreover, decrease of rural younger population is also problem for this sector.

(B) Aquaculture

Aquaculture is developed rapidly but sill lower at production scale and production level. Production scale is only 255t/year or 0.3% of national production, and production level is less than 4 t/ha/yr at 3.3 t/ha/yr in average. (Agricultural Master Plan 1992 –2015) Total area of aquaculture is estimated less than 100ha at 1995 year level.

Aquaculture, however, has a great potentiality comparing to other fisheries from the aspects of development. Other fisheries, marine and freshwater, have their own limitation on natural capacity and area potential. Aquaculture also has a potential to introduce new species favorable to climate and economy. Shrimp farming has been recently introduced in lagoon aquaculture. This is one of potential of aquaculture. Table 2.2-3-3 shows the existing aquaculture projects, of which developed area is 350ha and production is 727t/yr. Productivity is 2.1t/ha, that is evaluated as low productivity.

Table 2.2-3-3 Present Condition of Aquaculture

Project Location	Development Type	Department	Area (ha)	Fish	Production (t/yr)	Productivity (t/ha)
1 Central East Project	Pond	Dimbokro	10.68	Tilapia	47	4.4
2 Femes Project	Pond	Yamoussoukro	10	Tilapia	30	3.0
3 BAD-West Project	Pond	Biankouma, Bangolo, Danane, Duekoue, Guiglo, Man, Toulepleu	100	Tilapia + Silure	200	2.0
4 Central Project	Pond	Yamoussoukro, Tiebissou, Bouake	30	Tilapia	100	3.3
5 Daloa Project	Pond	Daloa	97	Tilapia, Cameroun	90	0.9
6 Adzope Project	Pond	private Adzope	45	Tilapia	120	2.7
7 Brobo Project	Pond	private Bouake	2	Tilapia	10	5.0
8 Bongouanou Project	Pond	private Bongouanou	3.5	Tilapia	10	2.9
9 Aboisso Project	Pond	private Aboisso	11	Tilapia	40	3.6
10 Alepe+Anyame Project	Pond	private Alepe	11	Tilapia + Silure	40	3.6
11 South-Western Project	Pond	San-Pedro	30	Tilapia	50	1.7
Total			350.18		737	2.1

(Source) DP, MINAGRA, 1989

Table 2.2-3-4 Evolution of Production of Fisheries and Aquaculture

	Year													Average		
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1986-95	1986-89	1993-95
Population (1000)	10,075	10,437	10,813	11,202	11,606	12,023	12,456	12,905	13,369	13,850	14,349	14,866	15,366	11,874	10,632	13,375
Industrial Marine Fisheries (1)																
Trawler	8,337	6,904	4,130	3,189	3,924	4,405	4,639	4,324	4,193	4,573	4,658	3,939	6,006	4,862	5,640	4,363
Round haul netter	40,414	34,573	24,786	28,812	34,870	29,857	34,584	24,690	23,745	20,997	25,572	19,547	21,473	29,733	32,146	23,144
Shrimp netter (1)																
Shrimps	423	365	463	385	388	189	171	168	176	196	195	198	185	292	409	180
Fishes	-	-	-	-	818	594	319	351	243	425	281	196	265	458		340
Total	49,174	41,842	29,379	32,386	40,000	35,045	39,713	29,533	28,357	26,191	30,706	23,880	27,929	35,162	38,195	28,027
Small Scale Fisheries (1)																
Marine fisheries (2)	15,000	15,000	16,000	18,000	20,000	26,480	31,923	26,813	30,017	32,663	15,010	31,255	32,099	23,190	16,000	29,831
Lagoon fisheries	12,000	12,000	12,000	13,000	14,000	-	-	-	-	-	-	-	-	12,600	12,250	
Inland fisheries (3)	21,000	21,000	21,000	25,000	21,000	21,401	15,404	13,477	15,604	11,335	8,452	12,032	12,501	18,622	22,000	13,472
Total	48,000	48,000	49,000	56,000	55,000	47,881	47,327	40,290	45,621	43,998	23,462	43,287	44,600	48,112	50,250	43,303
Aquaculture (1)																
Lagoon aquaculture	500	145	124	58	30	307	276	273	38	175	28	170	125	193	207	162
Inland aquaculture	-	-	-	-	-	20	20	78	78	162	1,100	280	737	72		106
Total	500	145	124	58	30	327	296	351	116	337	1,128	450	862	228	207	268
Grand Total (1)	97,674	89,987	78,503	88,444	95,030	83,253	87,336	70,174	74,094	70,526	55,296	67,617	73,391	83,502	88,652	71,598
Import (1) (except frozen tuna unload)								169,263	134,818	172,206						158,762
Total Consumption (1)								239,437	208,912	242,732						230,360
Per capita Consumption (kg/capita/yr)								19	16	18						17

(Data Source) Agricultural Statistics 1995 and 1998, DP, MINAGRA

(Notes)

- (1) not catching fishes by shrimp netter until 1989.
- (2) including lagoon fisheries after 1991.
- (3) modifying figures in 1987, 88, 89 and 90.

CHAPTER 4 EXISTING DEVELOPMENT PLAN FOR AGRICULTURE

4.1 Existing Agricultural Development Plan

(A) Objectives of Existing Agricultural Plan

Agricultural master plan was established for the period of 1992 – 2015 to realize following five (5) basic objectives:

- (a) Improving productivity and competitiveness by 1) modernizing the farms, 2) improving post-harvest process, and 3) adopting tax relief measures.
- (b) Searching for food self-sufficiency and security by improving productivity of various crops (especially rice) and increasing production of meat and milk.
- (c) Diversifying agricultural production further aiming at new exportable products in order to reduce the share of coffee and cocoa, and reaching a better balance at farm household level.
- (d) Developing marine and lagoon fisheries for exploiting potential rationally as well as development of inland fisheries through aquaculture.
- (e) Rehabilitating the forest stock on natural forest protection and development by afforestation in order to 1) bring back forests at 20% of the country, 2) mitigate negative effects of deforestation on ecology, 3) keep climate favorable for agricultural activities, and 4) enable timber production to cover domestic needs and to export by surplus.

For realizing above objectives, following strategies have been set in the master plan:

- (a) Improving productivity and competitiveness by 1) modernizing the farms, 2) improving post-harvest process, and 3) adopting tax relief measures.
- (b) Searching for food self-sufficiency and security by improving productivity of various crops (especially rice) and increasing production of meat and milk.
- (c) Diversifying agricultural production further aiming at new exportable products in order to reduce the share of coffee and cocoa, and reaching a better balance at farm household level.
- (d) Developing marine and lagoon fisheries for exploiting potential rationally as well as development of inland fisheries through aquaculture.
- (e) Rehabilitating the forest stock on natural forest protection and development by afforestation in order to 1) bring back forests at 20% of the country, 2) mitigate negative effects of deforestation on ecology, 3) keep climate favorable for agricultural activities, and 4) enable timber production to cover domestic needs and to export by surplus.

(B) Crop Production Program

According to the Agricultural Master Plan 1992 – 2015, crop production program is set as shown in Table 2.2-4-1. Encouragement has been given to industrial crops (rubber, cotton), food crops (rice), fruits (pineapple, citrus etc.), and vegetables. Among encouraged crops, rice

and rubber are planned to grow at especially high growth rates as 9.00% and 7.10% annually.

Table 2.2-4-1 Target of Crop Productions in Agricultural Master Plan 1992-2015

Crops	Production (1,000 t)						Annual Growth rate	Main objectives and actions to undertake
	Base 1990	Targets						
		1995	2000	2005	2010	2015		
Coffee	260	287	317	350	386	426	2.00%	Pruning improvement (arabusta quality), rehabilitation, productivity.
Cocoa	823	843	858	874	890	906	0.40%	
Palm oil	229	229	229	229	229	229	0%	Competitiveness, meeting to domestic demand, promotion of by-products.
Coconut oil	23	23	23	23	23	23	0%	
Rubber	82	115	163	229	323	456	7.10%	4% of world market by 2010.
Sugar	170	188	207	230	252	279	2.00%	Meeting to domestic demand.
Cotton lint	250	319	407	520	663	847	5.00%	Productivity, diversification, fibers/by-products, productivity, developments
Banana (*)	136	174	222	270	328	400	5%-4%	
Pineapple	214	293	402	550	754	1,033	6.50%	Productivity, quality restoration, markets, processing, export
Citrus fruits	18	23	29	37	48	61	5.00%	
Other fruits (**)	45	57	73	94	119	152	5.00%	off-season products, processing, self-sufficiency.
Paddy rice	687	1,057	1,626	2,502	3,850	5,924	9.00%	Development both of rain-fed and irrigation
Maize	484	561	650	754	874	1,013	3.00%	Expansion, storage, processing and export.
S.F.M. (***)	76	84	92	101	111	122	1.90%	Research and development
Yam	2,528	2,737	2,963	3,208	3,473	3,759	1.60%	Conservation, marketing, processing, off-season, Conditioning and marketing.
Plantain banana	1,086	1,176	1,273	1,378	1,492	1,615	1.60%	
Cassava	1,393	1,600	1,836	2,108	2,420	2,778	2.80%	Production and processing nearby consumption.
Groundnuts	134	158	185	218	256	302	3.30%	Production by region, expansion, conditioning, marketing, processing, off-season, self-sufficiency.
Vegetables	392	540	743	1,022	1,407	1,937	6.60%	

(Notes) (*): 5% until 2000 and 4% afterward. (**): cashew-nut, avocado, mango, goyava, papaya, others
(***): sorghum, fonio and millet

(C) National Rice Development Plan

National Rice Development Plan was studied and established for the year 2005 by PNR in 1997 to realize the target of Agricultural Master Plan 1992 - 2015. The study clarified the trend of paddy rice production as shown in Table 2.2-4-2 in case that production follows the population growth at 3.6% growth ratio.

Table 2.2-4-2 Rice Production Trend in Case following Population Growth

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Growth
Demand Projection of Rice											
Paddy (1000 t)	1,724	1,788	1,855	1,924	1,996	2,076	2,160	2,247	2,337	2,431	3.50%
Rice (1000 t)	866	899	932	967	1,003	1,043	1,080	1,124	1,168	1,215	0.5
Production Projection of Rice (1000 t)											
Rainfed paddy	798	830	864	897	934	970	1,009	1,050	1,091	1,134	3.60%
Irrigated paddy	70	74	74	77	80	83	86	93	96	99	3.60%
Total (1000 t)	868	904	938	974	1,014	1,053	1,095	1,143	1,187	1,233	3.60%
Import of Rice (1000 t)											
Paddy	856	884	917	950	982	1,023	1,065	1,104	1,150	1,198	3.40%
Rice	428	442	459	475	491	512	533	552	575	599	3.40%
Cultivation Area of Rice (1000ha)											
Rainfed paddy	570	593	617	641	667	693	721	750	779	810	3.60%
Irrigated paddy	22	23	23	24	25	26	27	29	30	31	3.60%
Total (ha)	592	616	640	665	692	719	748	779	809	841	3.60%
Population (1,000)	14,289	14,818	15,366	15,919	16,492	17,086	17,701	18,338	18,999	19,682	3.60%
Consumption (kg/p)	60.6	60.7	60.7	60.7	60.8	61.0	61.0	61.3	61.5	61.7	

(Source) Developpement de la Riziculture dans une Perspective Globale d'Autosuffisance Alimentaire, PNR, 1997

(Note) Population is estimated by JICA Study based on 1998 population with growth rates of 3.7% before 1998 and 3.6% afterward.

Total demand is estimated at 2,431,000t in paddy basis and 1,215,000t in polished rice basis to

keep a consumption level of 62 kg/capita/year in 2005. If production follows the same growth ratio of population, total production of paddy will be 1,233,000t in 2005, that is 51% of total demand, and 1,198,000t of paddy have to be imported. In this case, rainfed paddy is estimated to increase from 570,000ha to 810,000ha, and irrigated paddy from 22,000ha to 31,000ha.

On the other hand, rice production program has been set by the National Rice Production Plan as shown in Table 2.2-4-3.

Table 2.2-4-3 Rice Production Program by National Rice Production Plan (1996 - 2005)

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Growth Rate
Irrigated Paddy Area (1000ha)											
Total Area	21	30	33	36	40	44	48	52	56	64	11.8%
Annual Increase		9	3	3	4	4	4	4	4	8	
Cropping Intensity of Irrigated Paddy											
	1.25	1.27	1.3	1.32	1.34	1.37	1.39	1.42	1.44	1.47	1.6%
Cultivation Area (1000 ha)											
Rainfed	644	660	687	716	743	776	820	857	892	922	3.7%
Irrigated	26	38	43	48	54	60	67	74	81	94	13.7%
Total (1000 ha)	670	698	730	764	797	836	887	931	973	1,016	4.2%
Targeted Yield (t/ha)											
Rainfed	1.50	1.54	1.59	1.64	1.68	1.73	1.78	1.83	1.89	1.94	3.7%
Irrigated	3.20	3.35	3.50	3.66	3.82	4.00	4.18	4.37	4.57	4.78	4.1%
Average	1.57	1.64	1.70	1.77	1.82	1.89	1.96	2.03	2.11	2.20	3.4%
Paddy Production (1000 t)											
Rainfed	966	1,016	1,092	1,174	1,248	1,342	1,460	1,568	1,686	1,789	6.4%
Irrigated	84	128	150	174	205	241	279	323	369	450	18.2%
Total (1000 t)	1,050	1,144	1,242	1,348	1,453	1,584	1,738	1,891	2,054	2,238	7.9%

(Source) Développement de la Riziculture dans une Perspective Globale d'Autosuffisance Alimentaire, PNR, 1997

In the rice production program, following premises have been set for the year 2005 in the National Rice Production Plan. Premises are:

- To achieve production of 2,238,000t, that is 92% of 2,431,000t that is the supply amount required in 2005.
- To raise production of irrigated paddy to 20% of total production in 2005.
- To raise cropping intensity from 1.25 to 1.47 by 2005.
- To introduce HYV (high yielding variety) both in rainfed and irrigated fields at 100% level.
- To apply fertilizers and chemicals at 50% required level for rainfed paddy and 100% for irrigated paddy.
- To achieve the unit yields of paddy for rainfed at 1.94 t/ha and 4.78t/ha for irrigated.

Based on above premises, required paddy area is estimated at 922,000ha for rainfed paddy and 64,000ha for irrigated paddy, totally 986,000ha as shown in Table 2.2-4-3.

Taking hydrological and topographical conditions into consideration, development projects of the National Rice Development Plan are as follows:

Table 2.2-4-4 Facility Development Plan of the National Rice Development Plan

	(unit)	1995 Base Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Rehabilitation	(1000ha)	20	4	4	4	4	4						20.0
New Development													
Dam (60%)	(1000ha)	25.8	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	2.58	25.8
Pump (10%)	(1000ha)	4.3	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	4.3
Weir (30%)	(1000ha)	12.9	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	12.9
Total	(1000ha)	43	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	43
Number of Developments													
Dam (1/100ha)	(Nos)	258	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	258
Pump (1/25ha)	(Nos)	172	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	172
Weir (1/10ha)	(Nos)	1290	129.0	129.0	129.0	129.0	129.0	129.0	129.0	129.0	129.0	129.0	1290
Total	(Nos)	1,720	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	172.0	1720
Development Cost													
Rehabilitation	(M FCFA)	0.5 /ha	2,000	2,000	2,000	2,000	2,000						10,000
Dam	(M FCFA)	250 /No	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	6,450	64,500
Pump	(M FCFA)	10 /No	172	172	172	172	172	172	172	172	172	172	1,720
Weir	(M FCFA)	5 /No	645	645	645	645	645	645	645	645	645	645	6,450
Sub-total	(M FCFA)		9,267	9,267	9,267	9,267	9,267	7,267	7,267	7,267	7,267	7,267	82,670
Land Development													
Dam	(M FCFA)	2 /ha	5,160	5,160	5,160	5,160	5,160	5,160	5,160	5,160	5,160	5,160	51,600
Pump	(M FCFA)	2 /ha	860	860	860	860	860	860	860	860	860	860	8,600
Weir	(M FCFA)	1.5 /ha	1,935	1,935	1,935	1,935	1,935	1,935	1,935	1,935	1,935	1,935	19,350
Sub-total	(M FCFA)		7,955	7,955	7,955	7,955	7,955	7,955	7,955	7,955	7,955	7,955	79,550
Total	(M FCFA)		17,222	17,222	17,222	17,222	17,222	15,222	15,222	15,222	15,222	15,222	162,220

(Source) Developpement de la Riziculture dans une Perspective Globale d'Autosuffisance Alimentaire, PNR, 1997

As shown in Table 2.2-4-4, dam projects are estimated at 60%, weir at 10% and pump at 30% in area basis respectively. Each project size is estimated at 100ha for dam project, 25 ha for pump and 10 ha for weir. Based on above estimation, total development projects will be 1,720 projects and total cost will be 162.22 Billion FCFA by 2005.

4.2 Existing Livestock Development Plan

According to the Agricultural Master Plan 1992 – 2015, livestock products are planned to increase by 3.8% annually, that is slight higher growth rate than population, except milk. In the livestock development plan, reduction of meat import is not the main subject, but steady increase of meat production is the main subject. Milk is planned to increase by 5.0% annually to decrease milk import.

Table 2.2-4-5 Target of Livestock Production by the Agricultural Master Plan 1992-2015

Animal or Products	Production (1,000 t)						Annual Growth rate	Remarks
	Base 1990	1995	2000	2005	2010	2015		
Cattle	18	22	26	31	38	46	3.80%	Health and genetic actions, traditional and modern improved livestock breeding.
Sheep	6	7	9	11	12	15	3.80%	-ditto-
Pigs	7	8	10	12	14	18	3.80%	-ditto-
Poultry	18	22	26	31	38	46	3.80%	-ditto-
Eggs	14	17	20	24	29	36	3.80%	-ditto-
Milk	18	23	29	37	48	61	5%	

Based upon above production plan, livestock number will be increased as the same ratio of production. Number of livestock will be increased to 2.108 times in 2015 from 1995.

4.3 Existing Fishery Development Plan

According to the Agricultural Master Plan 1992 – 2015, great priority has been put on inland fishery, and less potential to marine and lagoon fishery from an aspect of natural capacity. As shown below, inland fishery is expected to grow with a great high ratio as 12% annum to realize self-sufficiency of fish production in 2015. On the other hand, marine and lagoon fishery is expected with less growth at 2.5% annum.

Table 2.2-4-3 Target of Fish Production by Agricultural Master Plan 1992 - 2015

Animal or Products	Production (1,000 t)						Annual Growth rate	Remarks
	Base 1990	Targets						
		1995	2000	2005	2010	2015		
Population (million)	11.60	13.85	16.49	19.68	23.49	28.03	3.6%	Estimated by 1988 population and growth rate
Marine & lagoon fishery	72	80	96	109	120	133	2.5%	Optimal potential of maritime and development of lagoon fishing.
Inland fishery	20	35	62	109	193	340	12%	Development of inland potential.
Total	92	115	158	218	313	473	6.8%	
Percapita consumption by national Production	7.9kg	8.3	9.6	11.1	13.3	16.9	3.1%	

(Source) Agricultural Master Plan 1992-2015

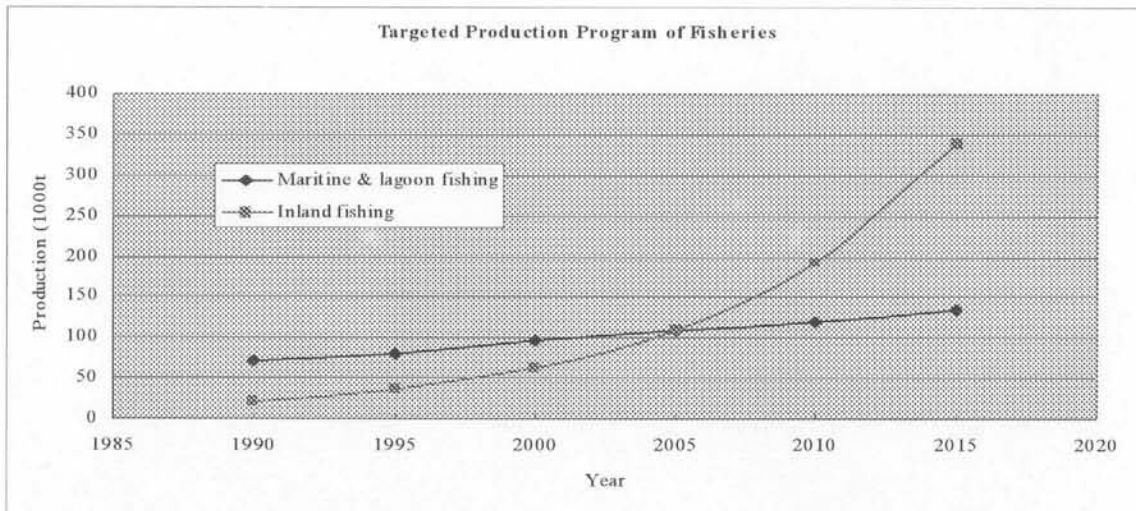


Figure 2.2-4-1 Target of Fish Production by Agricultural Master Plan 1992-2015

If, this plan is realized to produce 473,000 t of fish, it is expected to satisfy present demand of 17 kg/capita/year only by national product of fish.

CHAPTER 5 FRAMEWORK FOR AGRICULTURE IN 2015

Framework for agriculture will be set principally based on the Agricultural Master Plan 1992-2015, and the National Rice Development Plan 2005. In the framework, present condition is set in 1995 due to availability of statistical data.

5.1 Agricultural Framework in 2015

(A) General Direction of Farmland Expansion

Regarding to food crops, relation between present conditions and the target of the Agricultural Master Plan 1992 – 2015 are summarized as shown as in Table 2.2-5-1.

Table 2.2-5-1 Comparison of Production and Consumption Level of Food Crops between Present and Target Year

Target Year	Present (1995)		Growth	Future (2015)	
Population	13,824,000		Ratio (%/yr)	27,028,000	
	Production (t)	Consumption (kg/capita/yr)		Target (t)	Consumption (kg/capita/yr)
Food Crops					
Paddy Rice					
Production	868,430			5,924,000 (too High Target)	
Import	856,000			-	
Total	1,724,430			5,924,000	
Rice (0.5 x paddy)	862,215	62		2,962,000	110 rice
		rice	6.99%	3,352,000 (reasonable Target)	62 rice
				1,676,000	
Maize	552,040	39.9	3.08%	1,013,000	37.5
S.M.F.	90,980	6.6	1.48%	122,000	4.5
Yam	2,868,850	207.5	1.36%	3,759,000	139.1
Cassava	1,608,220	116.3	2.77%	2,778,000	102.8
Groundnuts	143,040	10.3	3.81%	302,000	11.2
Plantain Banana	1,335,320	96.6	0.96%	1,615,000	59.8
Taro	352,050	25.5			
Vegetables	540,000	39.1	6.59%	1,937,000	71.7

(Note) S.F.M Sorghum, Fonio, Millet

According to the Agricultural Master Plan 1992-2015, production target of paddy rice has been set at very high level able to achieve per-capita 110 kg consumption by national production. At present, demand of 62 kg per capita is satisfied by national production and import. PNR has a policy to achieve self-sufficiency at the level of 62 kg per capita per year. Consequently, the target of paddy rice production is set to achieve self-sufficiency at 62 kg per capita.

On the other hand, the target of vegetables is also set at high level to achieve production of 1,937,000 t and increase of supply from 39 kg to 72 kg per capita. To achieve it, crop area of

vegetables is to be increased at 6.59% per annum. As discussed in 2.2-1, vegetable consumption is still low level at about 1/3 of Japan in Cote d'Ivoire, so that vegetables are planned to increase at high level.

Industrial crops are difficult to give economical evaluation due to shortage of evaluation data in this study, and this is not a main subject in this study. It is, therefore, production plan of industrial crops are to follow the Agricultural Master Plan 1992 – 2015.

According to above considerations, agricultural land use plan will be as follows:

Table 2.2-5-2 Cropped Area and Production in 1995 and Target Year 2015

Crops	Year 1995				Growth Ratio of Area (%/yr)	Year 2015			
	Cropped Area (ha)	Yield (t/ha)	Production (t)	Area Ratio (%)		Cropped Area (ha)	Yield (t/ha)	Production (t)	Area Ratio (%)
Food Crops									
Paddy	592,000		868,430	8.2%	4.30%	1,373,000		3,353,560	11.9%
Rainfed Paddy	570,000	1.4	798,020	7.9%	4.06%	1,263,000	1.94	2,450,230	11.0%
Irrigated Paddy	22,000	3.2	70,410	0.3%	8.38%	110,000	8.212	903,330	1.0%
Maize	669,100	0.825	552,040	9.2%	3.08%	1,227,800	0.825	1,013,000	10.7%
S.F.M.	136,400	0.667	90,980	1.9%	1.48%	182,900	0.667	122,000	1.6%
Yam	264,900	10.83	2,868,850	3.7%	1.36%	347,090	10.83	3,759,000	3.0%
Cassava	316,200	5.086	1,608,220	4.4%	2.77%	546,160	5.086	2,778,000	4.7%
Ground nut	136,200	1.05	143,040	1.9%	3.81%	287,550	1.05	302,000	2.5%
Plantain Banana	1,203,000	1.11	1,335,320	16.6%	0.96%	1,454,960	1.11	1,615,000	12.6%
Taro	376,900	0.934	352,050	5.2%	0.00%	376,900	0.934	352,050	3.3%
Vegetables	27,000	20	540,000	0.4%	6.59%	96,830	20	1,937,000	0.8%
Total	3,721,700			51.3%	2.32%	5,893,190			51.2%
Perennial Crops									
Cocoa	1,723,400	0.5313	915,670	23.8%	0.00%	1,723,400	0.5313	915,670	15.0%
Coffee	1,250,000	0.1893	236,660	17.2%	2.98%	2,250,070	0.1893	426,000	19.6%
Oil Palm	150,700	1.824	274,900	2.1%	0.00%	150,700	1.824	274,900	1.3%
Coconut	53,140	0.433	23,020	0.7%	0.00%	53,140	0.433	23,020	0.5%
Rubber	64,680	1.072	69,320	0.9%	9.88%	425,470	1.072	456,000	3.7%
Total	3,241,920			44.7%	1.77%	4,602,780			40.0%
Industrial Crops									
Sugarcane	21,310	6.589	140,410	0.3%	3.49%	42,350	6.589	279,040	0.4%
Cotton	242,400	0.9625	233,320	3.3%	6.66%	880,000	0.9625	847,000	7.6%
Banana	5,600	41.43	232,000	0.1%	2.76%	9,650	41.43	400,000	0.1%
Pineapple	15,500	13.55	210,020	0.2%	8.29%	76,230	13.55	1,033,000	0.7%
Total	284,810			3.9%	6.52%	1,008,230			8.8%
Grand Total	7,248,430			100.0%	2.34%	11,504,200			100.0%

(Notes)

1) Yield of Irrigated Paddy Rice = 4.78 t/ha * 1.72 (crop cycle) = 8.212 t/ha (4.78 t/ha: PNR 2005 Target Yield: see Table 2.2-4-3)

To achieve the necessary agricultural production proposed in the Agricultural Master Plan 1992-2015, it is necessary to increase farmland from 7,248,430 ha in 1995 to 11,504,200 ha in 2015. Farmland is necessary to increase 2.34% annually. Among proposed crops, encouragement should be given to irrigated paddy rice and vegetables in food crops, and to rubber, cotton and pineapples in industrial crops.

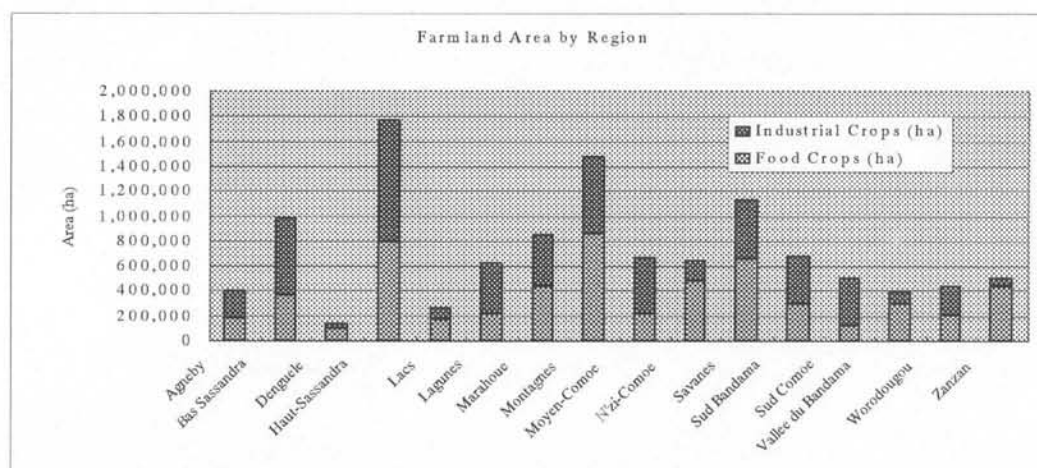
In order to satisfy above necessary increase of the area, farmland has been extended in accordance with the current trend of farmland scale in each department. The result of farmland extension is summarized as shown in Table 2.2-5-3.

Table 2.2-5-3 Farmland Area and Farming Scale by Region in 2015

Region	Area (km ²)	Agr. House holds	Food Crops (ha)	Industrial Crops (ha)	Total (ha)	(unit: ha)	
						Farming Scale (ha/household)	Area Ratio in the Area (%)
1 Agneby	9,105	52,283	189,840	214,830	404,670	7.7	44.4%
2 Bas Sassandra	26,205	422,105	371,400	607,270	978,670	2.3	37.3%
3 Denguele	20,892	17,590	103,480	36,160	139,640	7.9	6.7%
4 Haut-Sassandra	19,883	202,348	796,590	975,700	1,772,290	8.8	89.1%
5 Lacs	8,811	38,126	173,100	90,870	263,970	6.9	30.0%
6 Lagunes	13,296	116,525	223,890	402,620	626,510	5.4	47.1%
7 Marahoue	11,124	93,226	435,910	424,330	860,240	9.2	77.3%
8 Montagnes	30,941	222,464	869,400	610,870	1,480,270	6.7	47.8%
9 Moyen-Comoe	6,996	62,906	220,030	446,520	666,550	10.6	95.3%
10 N'zi-Comoe	19,597	51,109	480,640	163,600	644,240	12.6	32.9%
11 Savanes	40,146	107,279	660,180	476,900	1,137,080	10.6	28.3%
12 Sud Bandama	10,873	109,940	300,480	377,970	678,450	6.2	62.4%
13 Sud Comoe	7,614	79,338	124,800	380,530	505,330	6.4	66.4%
14 Vallee du Bandama	28,393	74,539	295,110	100,920	396,030	5.3	13.9%
15 Worodougou	30,770	76,623	212,760	223,440	436,200	5.7	14.2%
16 Zanzan	38,080	122,259	435,580	78,480	514,060	4.2	13.5%
Total	322,365	1,848,660	5,893,190	5,611,010	11,504,200	6.2	35.7%

(Note) Farmland distribution of each department is presented in Table 2.2-5-4.

Figure 2.2-5-1 Farmland Scale by the Region



The major issues are as follows:

- Farmland will share 36% of the country in 2015.
- Farming activities will be concentrated to certain regions, such as Haut Sassandra, Marahoue and Moyen-Comoe regions.
- In these regions, farmlands will share a large portion of the region, so that land use plan should be carefully established to preserve soil and water.

Table 2.2-5-4 Farmland Area and Farming Scale by Region and Department in 2015

(unit: ha)									
Region	Department	Area (km2)	Agr. House holds	Food Crops (ha)	Industrial Crops (ha)	Total (ha)	Farming Scale (ha/household)	Area Ratio in the Area (%)	
1	Agneby	5 Adzope	5,218	20,735	104,990	129,310	234,300	11.3	44.9%
1	Agneby	6 Agboville	3,887	31,548	84,850	85,520	170,370	5.4	43.8%
2	Bas Sassandra	43 San-Pedro	6,848	147,399	70,950	257,440	328,390	2.2	48.0%
2	Bas Sassandra	44 Sassandra	4,966	67,141	67,370	84,640	152,010	2.3	30.6%
2	Bas Sassandra	47 Soubre	8,540	187,299	197,220	257,930	455,150	2.4	53.3%
2	Bas Sassandra	48 Tabou	5,851	20,266	35,860	7,260	43,120	2.1	7.4%
3	Denguele	40 Odienne	20,892	17,590	103,480	36,160	139,640	7.9	6.7%
4	Haut-Sassandra	21 Da'loa	5,388	54,822	265,110	318,460	583,570	10.6	95.0%
4	Haut-Sassandra	28 Gagnoa	4,545	58,925	178,890	161,410	340,300	5.8	74.9%
4	Haut-Sassandra	32 Issia	3,722	32,623	184,290	302,250	486,540	14.9	95.0%
4	Haut-Sassandra	56 Vavoua	6,228	55,978	168,300	193,580	361,880	6.5	58.1%
5	Lacs	52 Tiebissou	2,307	10,867	38,600	21,180	59,780	5.5	25.9%
5	Lacs	55 Toumodi	2,698	8,073	44,250	23,820	68,070	8.4	25.2%
5	Lacs	571 Yamoussoukro1	2,108	13,178	41,650	18,660	60,310	4.6	28.6%
5	Lacs	572 Yamoussoukro2	1,698	6,008	48,600	27,210	75,810	12.6	44.6%
6	Lagunes	2 Abidjan	2,702	19,805	41,010	69,690	110,700	5.6	41.0%
6	Lagunes	8 Alepe	2,176	27,747	49,390	80,950	130,340	4.7	59.9%
6	Lagunes	20 Dabou	2,195	30,865	60,110	98,690	158,800	5.1	72.3%
6	Lagunes	30 Grand Lahou	2,036	14,749	20,680	43,790	64,470	4.4	31.7%
6	Lagunes	33 Jacqueville	745	1,012	9,260	15,200	24,460	24.2	32.8%
6	Lagunes	51 Tiassale	3,442	22,347	43,440	94,300	137,740	6.2	40.0%
7	Marahoue	15 Bouaffe	4,185	28,219	136,730	106,470	243,200	8.6	58.1%
7	Marahoue	41 Oume	2,358	17,812	107,680	85,010	192,690	10.8	81.7%
7	Marahoue	46 Sinfra	1,643	24,175	91,330	111,320	202,650	8.4	95.0%
7	Marahoue	58 Zuenoula	2,938	23,020	100,170	121,530	221,700	9.6	75.5%
8	Montagnes	9 Bangolo	2,127	39,516	78,920	28,330	107,250	2.7	50.4%
8	Montagnes	11 Biankouma	5,020	17,190	130,720	57,390	188,110	10.9	37.5%
8	Montagnes	22 Danane	4,601	43,628	251,720	154,160	405,880	9.3	88.2%
8	Montagnes	26 Duekoue	3,017	37,307	64,760	87,710	152,470	4.1	50.5%
8	Montagnes	31 Guiglo	10,557	46,215	100,490	105,920	206,410	4.5	19.6%
8	Montagnes	37 Man	4,808	31,685	222,680	156,140	378,820	12.0	78.8%
8	Montagnes	54 Toulepleu	811	6,923	20,110	21,220	41,330	6.0	51.0%
9	Moyen-Comoe	1 Abengourou	5,143	45,865	158,750	445,440	604,190	13.2	95.0%
9	Moyen-Comoe	7 Agnibilekrou	1,853	17,041	61,280	1,080	62,360	3.7	33.7%
10	N'zi-Comoe	12 Bocanda	3,262	10,829	91,210	17,580	108,790	10.0	33.4%
10	N'zi-Comoe	14 Bongouanou	5,593	18,996	211,860	73,810	285,670	15.0	51.1%
10	N'zi-Comoe	23 Daoukro	3,958	6,514	80,220	25,390	105,610	16.2	26.7%
10	N'zi-Comoe	24 Dimbokro	1,564	2,700	30,100	5,710	35,810	13.3	22.9%
10	N'zi-Comoe	39 M'bahiakro	5,220	12,070	67,250	41,110	108,360	9.0	20.8%
11	Savanes	18 Boundiali	7,956	17,360	106,050	74,820	180,870	10.4	22.7%
11	Savanes	27 Ferkesedougou	17,224	43,939	126,500	148,450	274,950	6.3	16.0%
11	Savanes	35 Korhogo	12,696	42,388	394,480	225,790	620,270	14.6	48.9%
11	Savanes	50 Tengrela	2,270	3,592	33,150	27,840	60,990	17.0	26.9%
12	Sud Bandama	25 Divo	8,139	81,819	229,130	300,310	529,440	6.5	65.0%
12	Sud Bandama	36 Lakota	2,734	28,121	71,350	77,660	149,010	5.3	54.5%
13	Sud Comoe	3 Aboisso	4,474	48,571	70,750	237,920	308,670	6.4	69.0%
13	Sud Comoe	4 Adiake	1,714	21,761	31,520	105,680	137,200	6.3	80.0%
13	Sud Comoe	29 Grand Bassam	1,426	9,006	22,530	36,930	59,460	6.6	41.7%
14	Vallee du Bandama	10 Beoumi	2,609	17,820	57,210	25,000	82,210	4.6	31.5%
14	Vallee du Bandama	16 Bouake	4,709	13,423	85,590	19,330	104,920	7.8	22.3%
14	Vallee du Bandama	19 Dabakala	9,761	18,714	48,350	4,200	52,550	2.8	5.4%
14	Vallee du Bandama	34 Katiola	9,440	19,991	66,010	34,750	100,760	5.0	10.7%
14	Vallee du Bandama	42 Sakassou	1,874	4,591	37,950	17,640	55,990	12.1	29.7%
15	Worodougou	38 Mankono	10,603	41,703	72,020	158,860	230,880	5.5	21.8%
15	Worodougou	45 Seguela	11,460	17,658	58,820	41,980	100,800	5.7	8.8%
15	Worodougou	53 Touba	8,707	17,262	81,920	22,600	104,520	6.1	12.0%
16	Zanzan	13 Bondoukou	9,844	60,376	113,530	16,690	130,220	2.2	13.2%
16	Zanzan	17 Bouna	21,846	27,669	170,130	4,860	174,990	6.3	8.0%
16	Zanzan	49 Tanda	6,390	34,214	151,920	56,930	208,850	6.1	32.7%
1	Agneby		9,105	52,283	189,840	214,830	404,670	7.7	44.4%
2	Bas Sassandra		26,205	422,105	371,400	607,270	978,670	2.3	37.3%
3	Denguele		20,892	17,590	103,480	36,160	139,640	7.9	6.7%
4	Haut-Sassandra		19,883	202,348	796,590	975,700	1,772,290	8.8	89.1%
5	Lacs		8,811	38,126	173,100	90,870	263,970	6.9	30.0%
6	Lagunes		13,296	116,525	223,890	402,620	626,510	5.4	47.1%
7	Marahoue		11,124	93,226	435,910	424,330	860,240	9.2	77.3%
8	Montagnes		30,941	222,464	869,400	610,870	1,480,270	6.7	47.8%
9	Moyen-Comoe		6,996	62,906	220,030	446,520	666,550	10.6	95.3%
10	N'zi-Comoe		19,597	51,109	480,640	163,600	644,240	12.6	32.9%
11	Savanes		40,146	107,279	660,180	476,900	1,137,080	10.6	28.3%
12	Sud Bandama		10,873	109,940	300,480	377,970	678,450	6.2	62.4%
13	Sud Comoe		7,614	79,338	124,800	380,530	505,330	6.4	66.4%
14	Vallee du Bandama		28,393	74,539	295,110	100,920	396,030	5.3	13.9%
15	Worodougou		30,770	76,623	212,760	223,440	436,200	5.7	14.2%
16	Zanzan		38,080	122,259	435,580	78,480	514,060	4.2	13.5%
Total			322,365	1,848,660	5,893,190	5,611,010	11,504,200	6.2	35.7%

Table 2.2-5-5 Food Crop Area and Production by Department in 2015

Cropped Area		(unit: ha)									
Department	Rainfed Paddy	Irrigated Paddy	Maize	S.F.M.	Yam	Cassava	Ground nut	Plantain Banana	Taro	Vegetables	Total
1 Abengourou	10,390	150	25,540	0	8,490	2,250	4,670	70,430	35,000	1,830	158,750
2 Abidjan	1,170	50	3,820	0	1,140	7,390	400	17,140	4,700	5,200	41,010
3 Aboisso	4,010	50	8,170	0	1,990	15,720	1,290	31,690	6,400	1,430	70,750
4 Adiaké	1,770	50	3,630	0	880	7,010	570	14,110	2,850	650	31,520
5 Adzope	7,220	100	25,970	0	900	16,880	930	36,530	14,670	1,790	104,990
6 Agboville	10,840	200	16,530	0	3,620	9,600	1,250	31,340	9,930	1,540	84,850
7 Agnibilekrou	4,030	0	9,870	0	3,280	860	1,820	27,210	13,530	680	61,280
8 Alepe	1,420	50	4,590	0	1,380	8,900	490	20,620	5,660	6,280	49,390
9 Bangolo	28,320	1,450	9,870	0	200	18,260	400	19,560	0	860	78,920
10 Beoumi	4,300	1,200	16,860	0	9,600	9,760	3,930	7,930	2,880	750	57,210
11 Biankouma	50,520	1,750	35,420	0	0	12,660	1,860	27,720	0	790	130,720
12 Bocanda	15,950	0	21,400	0	10,350	8,530	3,420	23,980	6,790	790	91,210
13 Bondoukou	3,060	600	30,220	0	19,310	19,500	1,710	23,500	14,050	1,580	113,530
14 Bongouanou	37,050	250	49,730	0	24,020	19,850	7,940	55,720	15,760	1,540	211,860
15 Bouaflé	30,070	700	29,490	0	7,550	12,490	4,770	44,690	5,500	1,470	136,730
16 Bouaké	6,200	2,050	24,310	0	13,840	14,060	5,700	11,440	4,150	3,840	85,590
17 Bouna	9,020	500	59,050	57,540	19,920	3,750	18,560	0	680	1,110	170,130
18 Boundiali	21,980	8,550	30,550	15,070	4,830	0	24,030	0	0	1,040	106,050
19 Dabakala	8,660	1,250	11,800	0	11,160	600	14,230	0	0	650	48,350
20 Dabou	1,710	50	5,600	0	1,680	10,810	590	25,130	6,900	7,640	60,110
21 Daloa	30,930	1,400	32,370	0	8,410	10,550	6,630	137,380	34,140	3,300	265,110
22 Danane	75,780	3,900	40,130	0	0	64,020	610	58,460	6,880	1,940	251,720
23 Daoukro	13,960	350	18,720	0	9,050	7,480	3,000	21,000	5,940	720	80,220
24 Dinbokro	5,180	500	6,950	0	3,350	2,780	1,100	7,790	2,200	250	30,100
25 Divo	46,780	150	34,190	0	5,180	9,120	1,180	101,980	27,180	3,370	229,130
26 Duékoué	32,730	1,500	9,870	0	0	8,080	0	10,930	430	1,220	64,760
27 Ferkessedougou	7,220	10,900	49,580	43,700	3,320	930	9,270	0	0	1,580	126,500
28 Gagnoa	56,260	1,100	25,030	0	4,250	6,430	2,320	62,380	18,790	2,330	178,890
29 Grand Bassam	640	50	2,090	0	630	4,060	210	9,400	2,580	2,870	22,530
30 Grand Lahou	640	50	2,150	0	660	4,150	210	9,640	2,640	540	20,680
31 Guiglo	50,900	2,350	15,380	0	0	12,590	0	16,990	670	1,610	100,490
32 Issia	21,580	950	22,590	0	5,870	7,360	4,600	95,870	23,820	1,650	184,290
33 Jacqueville	270	0	860	0	260	1,680	80	3,870	1,060	1,180	9,260
34 Katiola	10,840	1,600	16,530	7,510	12,070	970	15,450	0	0	1,040	66,010
35 Korhogo	147,940	23,750	108,630	40,130	21,120	590	49,490	0	0	2,830	394,480
36 Lakota	14,580	50	10,680	0	1,610	2,830	380	31,820	8,470	930	71,350
37 Man	79,920	4,050	27,910	0	560	51,610	1,140	55,190	0	2,300	222,680
38 Mankono	23,840	2,900	16,900	0	7,060	4,200	15,830	0	0	1,290	72,020
39 M'bahiakro	5,050	1,400	19,910	0	11,320	11,500	4,640	9,350	3,400	680	67,250
40 Odiéne	28,870	3,650	30,700	14,240	8,750	2,570	13,300	0	0	1,400	103,480
41 Oumé	33,950	650	15,120	0	2,560	3,890	1,390	37,670	11,340	1,110	107,680
42 Sakassou	2,810	1,400	11,030	0	6,260	6,370	2,580	5,190	1,880	430	37,950
43 San-Pedro	29,910	1,200	15,560	0	1,870	4,990	270	11,930	2,600	2,620	70,950
44 Sassandra	28,940	1,100	15,070	0	1,810	4,840	270	11,540	2,510	1,290	67,370
45 Seguela	19,450	2,400	13,780	0	5,770	3,420	12,920	0	0	1,080	58,820
46 Sintra	20,050	450	19,690	0	5,040	8,340	3,190	29,820	3,670	1,080	91,330
47 Soubre	84,630	3,250	44,040	0	5,310	14,110	840	33,730	7,330	3,980	197,220
48 Tabou	15,330	600	7,980	0	970	2,560	150	6,110	1,330	830	35,860
49 Tanda	4,140	750	40,610	0	25,940	26,200	2,320	31,590	18,900	1,470	151,920
50 Tengrela	6,890	2,550	9,580	4,710	1,510	0	7,520	0	0	390	33,150
51 Tiassale	1,370	50	4,510	0	1,360	8,740	460	20,280	5,560	1,110	43,440
52 Tiebissou	2,860	1,050	11,230	0	6,390	6,490	2,620	5,290	1,920	750	38,600
53 Touba	39,680	2,400	23,620	0	2,710	3,990	8,660	0	0	860	81,920
54 Toulepleu	10,190	450	3,080	0	0	2,520	0	3,410	140	320	20,110
55 Toumodi	3,260	1,900	12,700	0	7,230	7,360	2,980	5,970	2,170	680	44,250
56 Vavoua	19,680	850	20,590	0	5,350	6,700	4,200	87,390	21,710	1,830	168,300
571 Yamoussoukro1	3,680	7,400	9,910	0	5,630	5,730	2,300	4,660	1,690	650	41,650
572 Yamoussoukro2	2,530	1,450	14,460	0	8,230	8,360	3,380	6,800	2,460	930	48,600
58 Zuenoula	22,050	500	21,650	0	5,540	9,170	3,500	32,790	4,040	930	100,170
Total	1,263,000	110,000	1,227,800	182,900	347,090	546,160	287,550	1,454,960	376,900	96,830	5,893,190
Yield (t/ha)	1.940	8.212	0.825	0.667	10.830	5.086	1.050	1.110	0.934	20.000	

Table 2.2-5-5 Food Crop Area and Production by Department in 2015

(Continued)

Present Department	Production (unit t)									
	Rainfed Paddy	Irrigated Paddy	Maize	S.F.M.	Yam	Cassava	Ground nut	Plantain Banana	Taro	Vegetables
1 Abengourou	20,160	1,230	21,070	0	91,950	11,440	4,900	78,180	32,690	36,600
2 Abidjan	2,270	410	3,150	0	12,350	37,590	420	19,030	4,390	104,000
3 Aboisso	7,780	410	6,740	0	21,550	79,950	1,350	35,180	5,980	28,600
4 Adiake	3,430	410	2,990	0	9,530	35,650	600	15,660	2,660	13,000
5 Adzope	14,010	820	21,430	0	9,750	85,850	980	40,550	13,700	35,800
6 Agboville	21,030	1,640	13,640	0	39,200	48,830	1,310	34,790	9,270	30,800
7 Agnibilekrou	7,820	0	8,140	0	35,520	4,370	1,910	30,200	12,640	13,600
8 Alepe	2,750	410	3,790	0	14,950	45,270	510	22,890	5,290	125,600
9 Bangolo	54,940	11,910	8,140	0	2,170	92,870	420	21,710	0	17,200
10 Beoumi	8,340	9,850	13,910	0	103,970	49,640	4,130	8,800	2,690	15,000
11 Biankouma	98,010	14,370	29,220	0	0	64,390	1,950	30,770	0	15,800
12 Bocanda	30,940	0	17,660	0	112,090	43,380	3,590	26,620	6,340	15,800
13 Bondoukou	5,940	4,930	24,930	0	209,130	99,180	1,800	26,090	13,120	31,600
14 Bongouanou	71,880	2,050	41,030	0	260,140	100,960	8,340	61,850	14,720	30,800
15 Bouaflé	58,340	5,750	24,330	0	81,770	63,520	5,010	49,610	5,140	29,400
16 Bouake	12,030	16,830	20,060	0	149,890	71,510	5,990	12,700	3,880	76,800
17 Bouna	17,500	4,110	48,720	38,380	215,730	19,070	19,490	0	640	22,200
18 Boundiali	42,640	70,210	25,200	10,050	52,310	0	25,230	0	0	20,800
19 Dabakala	16,800	10,270	9,740	0	120,860	3,050	14,940	0	0	13,000
20 Dabou	3,320	410	4,620	0	18,190	54,980	620	27,890	6,440	152,800
21 Daloa	60,000	11,500	26,710	0	91,080	53,660	6,960	152,490	31,890	66,000
22 Danane	147,010	32,030	33,110	0	0	325,610	640	64,890	6,430	38,800
23 Daoukro	27,080	2,870	15,440	0	98,010	38,040	3,150	23,310	5,550	14,400
24 Dimbokro	10,050	4,110	5,730	0	36,280	14,140	1,160	8,650	2,050	5,000
25 Divo	90,750	1,230	28,210	0	56,100	46,380	1,240	113,200	25,390	67,400
26 Duekoue	63,500	12,320	8,140	0	0	41,090	0	12,130	400	24,400
27 Ferkessedougou	14,010	89,510	40,900	29,150	35,960	4,730	9,730	0	0	31,600
28 Gagnoa	109,140	9,030	20,650	0	46,030	32,700	2,440	69,240	17,550	46,600
29 Grand Bassam	1,240	410	1,720	0	6,820	20,650	220	10,430	2,410	57,400
30 Grand Lahou	1,240	410	1,770	0	7,150	21,110	220	10,700	2,470	10,800
31 Guiglo	98,750	19,300	12,690	0	0	64,030	0	18,860	630	32,200
32 Issia	41,870	7,800	18,640	0	63,570	37,430	4,830	106,420	22,250	33,000
33 Jacqueville	520	0	710	0	2,820	8,540	80	4,300	990	23,600
34 Katiola	21,030	13,140	13,640	5,010	130,720	4,930	16,220	0	0	20,800
35 Korhogo	287,000	195,040	89,620	26,770	228,730	3,000	51,960	0	0	56,600
36 Lakota	28,290	410	8,810	0	17,440	14,390	400	35,320	7,910	18,600
37 Man	155,040	33,260	23,030	0	6,060	262,490	1,200	61,260	0	46,000
38 Mankono	46,250	23,810	13,940	0	76,460	21,360	16,620	0	0	25,800
39 M'bahikro	9,800	11,500	16,430	0	122,600	58,490	4,870	10,380	3,180	13,600
40 Odiénne	56,010	29,970	25,330	9,500	94,760	13,070	13,970	0	0	28,000
41 Oumé	65,860	5,340	12,470	0	27,720	19,780	1,460	41,810	10,590	22,200
42 Sakassou	5,450	11,500	9,100	0	67,800	32,400	2,710	5,760	1,760	8,600
43 San-Pedro	58,030	9,850	12,840	0	20,250	25,380	280	13,240	2,430	52,400
44 Sassandra	56,140	9,030	12,430	0	19,600	24,620	280	12,810	2,340	25,800
45 Seguela	37,730	19,710	11,370	0	62,490	17,390	13,570	0	0	21,600
46 Sinfra	38,900	3,700	16,240	0	54,580	42,420	3,350	33,100	3,430	21,600
47 Soubre	164,180	26,690	36,330	0	57,510	71,760	880	37,440	6,850	79,600
48 Tabou	29,740	4,930	6,580	0	10,510	13,020	160	6,780	1,240	16,600
49 Tanda	8,030	6,160	33,500	0	280,930	133,250	2,440	35,060	17,650	29,400
50 Tengrela	13,370	20,940	7,900	3,140	16,350	0	7,900	0	0	7,800
51 Tiassalé	2,660	410	3,720	0	14,730	44,450	480	22,510	5,190	22,200
52 Tiebissou	5,550	8,620	9,260	0	69,200	33,010	2,750	5,870	1,790	15,000
53 Touba	76,980	19,710	19,490	0	29,350	20,290	9,090	0	0	17,200
54 Toulepleu	19,770	3,700	2,540	0	0	12,820	0	3,790	130	6,400
55 Toumodi	6,320	15,600	10,480	0	78,300	37,430	3,130	6,630	2,030	13,600
56 Vavoua	38,180	6,980	16,990	0	57,940	34,080	4,410	97,000	20,280	36,600
571 Yamoussoukro1	7,140	60,770	8,180	0	60,970	29,140	2,420	5,170	1,580	13,000
572 Yamoussoukro2	4,910	11,910	11,930	0	89,130	42,520	3,550	7,550	2,300	18,600
58 Zuenoula	42,780	4,110	17,860	0	60,000	46,640	3,680	36,400	3,770	18,600
Total	2,450,230	903,330	1,013,000	122,000	3,759,000	2,778,000	302,000	1,615,000	352,050	1,937,000

Table 2.2-5-6 Industrial Crop Area and Production by Department in 2015

Planted Area										(Unit: ha)
Department	Cocoa	Coffee	Oil Palm	Coconut	Rubber	Sugarcane	Cotton	Banana	Pineapple	Total
1 Abengourou	136,620	103,410	0	0	204,910	0	0	500	0	445,440
2 Abidjan	13,020	29,880	8,370	4,460	5,660	0	0	2,450	5,850	69,690
3 Aboisso	29,470	167,040	31,380	7,130	0	0	0	690	2,210	237,920
4 Adiake	13,130	74,410	13,980	3,180	0	0	0	0	980	105,680
5 Adzope	52,620	75,300	0	0	0	0	110	50	1,230	129,310
6 Agboville	24,840	44,790	0	0	0	0	220	5,100	10,570	85,520
7 Agnibilekrou	0	0	0	0	0	0	220	860	0	1,080
8 Alepe	15,670	35,970	10,080	5,370	6,780	0	0	0	7,080	80,950
9 Bangolo	6,260	22,070	0	0	0	0	0	0	0	28,330
10 Beoumi	0	12,110	0	0	0	0	12,890	0	0	25,000
11 Biankouma	920	56,470	0	0	0	0	0	0	0	57,390
12 Bocanda	2,220	14,710	0	0	0	0	650	0	0	17,580
13 Bondoukou	6,160	9,950	0	0	0	0	580	0	0	16,690
14 Bongouanou	44,340	27,040	0	0	0	0	2,430	0	0	73,810
15 Bouaflé	36,060	49,320	0	0	0	0	21,090	0	0	106,470
16 Bouake	0	1,940	0	0	0	0	3,520	0	13,870	19,330
17 Bouna	0	0	0	0	0	0	4,860	0	0	4,860
18 Boundiali	0	0	0	0	0	0	74,820	0	0	74,820
19 Dabakala	0	1,300	0	0	0	0	2,900	0	0	4,200
20 Dabou	19,090	43,830	12,280	6,530	8,350	0	0	0	8,610	98,690
21 Daloa	146,280	160,310	0	0	0	0	11,870	0	0	318,460
22 Danane	21,530	132,630	0	0	0	0	0	0	0	154,160
23 Daoukro	13,520	10,820	0	0	0	0	1,050	0	0	25,390
24 Dimbokro	720	4,770	0	0	0	0	220	0	0	5,710
25 Divo	189,340	87,630	17,180	2,180	0	0	0	0	3,980	300,310
26 Duekoué	30,910	56,470	0	0	0	0	330	0	0	87,710
27 Ferkessedougou	0	0	0	0	0	11,920	136,530	0	0	148,450
28 Gagnoa	103,500	40,680	0	0	16,250	0	980	0	0	161,410
29 Grand Bassam	7,140	16,400	4,600	2,450	3,090	0	0	0	3,250	36,930
30 Grand Lahou	19,410	12,760	0	11,370	0	0	0	0	250	43,790
31 Guiglo	42,610	48,840	0	0	14,470	0	0	0	0	105,920
32 Issia	127,690	173,940	0	0	0	0	620	0	0	302,250
33 Jacqueville	2,950	6,770	1,890	1,010	1,250	0	0	0	1,330	15,200
34 Katiola	0	220	0	0	0	6,800	27,730	0	0	34,750
35 Korhogo	0	0	0	0	0	0	225,790	0	0	225,790
36 Lakota	38,270	39,390	0	0	0	0	0	0	0	77,660
37 Man	12,050	144,090	0	0	0	0	0	0	0	156,140
38 Mankono	0	4,540	0	0	0	0	154,320	0	0	158,860
39 M'bahiakro	1,010	27,250	0	0	0	11,800	1,050	0	0	41,110
40 Odiéne	0	0	0	0	0	0	36,160	0	0	36,160
41 Oumé	67,620	17,320	0	0	0	0	70	0	0	85,010
42 Sakassou	0	15,570	0	0	0	0	2,070	0	0	17,640
43 San-Pedro	47,200	29,430	18,990	0	161,820	0	0	0	0	257,440
44 Sassandra	19,960	35,480	19,740	9,460	0	0	0	0	0	84,640
45 Seguela	0	1,940	0	0	0	0	40,040	0	0	41,980
46 Sinfra	60,070	48,890	0	0	0	0	2,360	0	0	111,320
47 Soubré	189,250	56,470	12,210	0	0	0	0	0	0	257,930
48 Tabou	4,880	2,380	0	0	0	0	0	0	0	7,260
49 Tanda	23,640	31,370	0	0	0	0	1,920	0	0	56,930
50 Tengrela	0	0	0	0	0	0	27,840	0	0	27,840
51 Tiassale	45,080	31,370	0	0	0	0	830	0	17,020	94,300
52 Tiebissou	6,270	12,910	0	0	0	0	2,000	0	0	21,180
53 Touba	0	9,950	0	0	0	5,830	6,820	0	0	22,600
54 Toulepleu	8,540	9,790	0	0	2,890	0	0	0	0	21,220
55 Toumodi	21,800	1,510	0	0	0	0	510	0	0	23,820
56 Vavoua	55,200	99,090	0	0	0	6,000	33,290	0	0	193,580
571 Yamoussoukro1	5,530	11,390	0	0	0	0	1,740	0	0	18,660
572 Yamoussoukro2	8,070	16,600	0	0	0	0	2,540	0	0	27,210
58 Zuenoula	2,940	81,560	0	0	0	0	37,030	0	0	121,530
Total	1,723,400	2,250,070	150,700	53,140	425,470	42,350	880,000	9,650	76,230	5,611,010

Yield of Industrial Crops (t/ha)									
Yield (t/ha)	0.5313	0.1893	1.824	0.4330	1.072	6.589	0.9625	41.43	13.55

Table 2.2-5-6 Industrial Crop Area and Production by Department in 2015
(Continued)

Production	(unit: t)								
Department	Cocoa	Coffee	Oil Palm	Coconut	Rubber	Sugarcane	Cotton	Banana	Pineapple
1 Abengourou	72,590	19,580	0	0	219,660	0	0	20,720	0
2 Abidjan	6,920	5,660	15,270	1,930	6,070	0	0	101,500	79,270
3 Aboisso	15,660	31,630	57,240	3,090	0	0	0	28,590	29,950
4 Adiake	6,980	14,090	25,500	1,380	0	0	0	0	13,280
5 Adzope	27,960	14,250	0	0	0	0	110	2,070	16,670
6 Agboville	13,200	8,480	0	0	0	0	210	211,290	143,220
7 Agnibilekrou	0	0	0	0	0	0	210	35,630	0
8 Alepe	8,330	6,810	18,390	2,330	7,270	0	0	0	95,930
9 Bangolo	3,330	4,180	0	0	0	0	0	0	0
10 Beoumi	0	2,290	0	0	0	0	12,410	0	0
11 Biankouma	490	10,690	0	0	0	0	0	0	0
12 Bocanda	1,180	2,780	0	0	0	0	630	0	0
13 Bondoukou	3,270	1,880	0	0	0	0	560	0	0
14 Bongouanou	23,560	5,120	0	0	0	0	2,340	0	0
15 Bouafle	19,160	9,340	0	0	0	0	20,300	0	0
16 Bouake	0	370	0	0	0	0	3,390	0	187,940
17 Bouna	0	0	0	0	0	0	4,680	0	0
18 Boundiali	0	0	0	0	0	0	72,010	0	0
19 Dabakala	0	250	0	0	0	0	2,790	0	0
20 Dabou	10,140	8,300	22,400	2,830	8,950	0	0	0	116,670
21 Daloa	77,720	30,350	0	0	0	0	11,420	0	0
22 Danane	11,440	25,110	0	0	0	0	0	0	0
23 Daoukro	7,180	2,050	0	0	0	0	1,010	0	0
24 Dimbokro	380	900	0	0	0	0	210	0	0
25 Divo	100,600	16,590	31,340	940	0	0	0	0	53,930
26 Dzekoue	16,420	10,690	0	0	0	0	320	0	0
27 Ferkessedougou	0	0	0	0	0	78,540	131,410	0	0
28 Gagnoa	54,990	7,700	0	0	17,420	0	940	0	0
29 Grand Bassam	3,790	3,100	8,390	1,060	3,310	0	0	0	44,040
30 Grand Lahou	10,310	2,420	0	4,920	0	0	0	0	3,390
31 Guiglo	22,640	9,250	0	0	15,510	0	0	0	0
32 Issia	67,840	32,940	0	0	0	0	600	0	0
33 Jacqueline	1,570	1,280	3,450	440	1,340	0	0	0	18,020
34 Katiola	0	40	0	0	0	44,810	26,690	0	0
35 Korhogo	0	0	0	0	0	0	217,320	0	0
36 Lakota	20,330	7,460	0	0	0	0	0	0	0
37 Man	6,400	27,280	0	0	0	0	0	0	0
38 Mankono	0	860	0	0	0	0	148,530	0	0
39 M'bahiakro	540	5,160	0	0	0	77,750	1,010	0	0
40 Odiene	0	0	0	0	0	0	34,800	0	0
41 Oume	35,930	3,280	0	0	0	0	70	0	0
42 Sakassou	0	2,950	0	0	0	0	1,990	0	0
43 San-Pedro	25,080	5,570	34,640	0	173,470	0	0	0	0
44 Sassandra	10,600	6,720	36,010	4,100	0	0	0	0	0
45 Seguela	0	370	0	0	0	0	38,540	0	0
46 Sinfra	31,920	9,250	0	0	0	0	2,270	0	0
47 Soubre	100,550	10,690	22,270	0	0	0	0	0	0
48 Tabou	2,590	450	0	0	0	0	0	0	0
49 Tanda	12,560	5,940	0	0	0	0	1,850	0	0
50 Tengrela	0	0	0	0	0	0	26,800	0	0
51 Tiassale	23,950	5,940	0	0	0	0	800	0	230,620
52 Tiebissou	3,330	2,440	0	0	0	0	1,930	0	0
53 Touba	0	1,880	0	0	0	38,410	6,560	0	0
54 Toulepleu	4,540	1,850	0	0	3,100	0	0	0	0
55 Toumodi	11,580	290	0	0	0	0	490	0	0
56 Vavoua	29,330	18,760	0	0	0	39,530	32,040	0	0
571 Yamoussoukro1	2,940	2,160	0	0	0	0	1,670	0	0
572 Yamoussoukro2	4,290	3,140	0	0	0	0	2,440	0	0
58 Zuenoula	1,560	15,440	0	0	0	0	35,640	0	0
Total	915,670	426,000	274,900	23,020	456,000	279,040	847,000	400,000	1,033,000

(B) Direction of Irrigation Expansion

Regarding to irrigated paddy rice, basic plan should stand on the PNR 2005 Plan as explained in Table 2.2-5-7. The target has been set for paddy rice to realize a production of 3,352,000t in 2015. When rainfed paddy area is expanded with an annual growth ratio of 3.2%, that is assumed to be same growth ratio of population after 2005, rainfed paddy production will reach 2,450,000t in 2015. If rainfed paddy rice realizes this production, burden of irrigated paddy rice is 902,000t in 2015. For realizing this production, irrigated paddy rice will be expanded to 110,000ha with a cropping intensity of 1.72 in 2015.

Table 2.2-5-7 2015 Rice Development Plan based on 2005 PNR Plan

Year	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	Growth Rate (%/yr)	2015 with a same growth	Growth Rate 2005-2015 (%/yr)	2015 required
Irrigated Paddy Area (1000ha)														
Total Area	21	30	33	36	40	44	48	52	56	64	11.8%	195	5.6%	110.5)
Annual Increase		9	3	3	4	4	4	4	4	8				
Cropping Intensity of Irrigated Paddy														
	1.25	1.27	1.3	1.32	1.34	1.37	1.39	1.42	1.44	1.47	1.6%	1.72	1.6%	1.72.5)
Cultivation Area (1000 ha)														
Rainfed	644	660	687	716	743	776	820	857	892	922	3.7%	1,326	3.2% 2)	1,263.2)
Irrigated	26	38	43	48	54	60	67	74	81	94	13.6%	335	7.2%	189.4)
Total (1000 ha)	670	698	730	764	797	836	887	931	973	1,016	4.2%	1,661	3.6%	1,452
Targeted Yield (t/ha)														
Rainfed	1.50	1.54	1.59	1.64	1.68	1.73	1.78	1.83	1.89	1.94	2.6%	1.94	0.0%	1.94.3)
Irrigated	3.20	3.35	3.50	3.66	3.82	4.00	4.18	4.37	4.57	4.78	4.1%	4.78	0.0%	4.78.4)
Average	1.57	1.64	1.70	1.77	1.82	1.89	1.96	2.03	2.11	2.20	3.4%	2.51	0.5%	2.31
Paddy Production (1000 t)														
Rainfed	966	1,016	1,092	1,174	1,248	1,342	1,460	1,568	1,686	1,789	6.4%	2,572	3.2%	2,450.3)
Irrigated	84	128	150	174	205	241	279	323	369	449	18.3%	1,603	7.2%	902.4)
Total (1000 t)	1,050	1,144	1,242	1,348	1,453	1,584	1,738	1,891	2,054	2,238	7.9%	4,176	4.1%	3,352.1)

(Source) 1995-2005: Developpement de la Riziculture dans une Perspective Globale d'Autosuffisance Alimentaire, PNR, 1997

(Notes)

- 1) Production target has been set at 3,352,000t as framed in Table 2.2-5-1.
- 2) Growth of rainfed paddy area is considered to be same growth ratio of population, that is forecasted to be 3.2%, and reach 1,263,000ha.
- 3) When rainfed paddy area reach 1,263,000ha with an yield of 1.94t/ha, it is possible to product paddy rice of 2,450,000t.
- 4) When rainfed paddy realizes 2,450,000t production, burden of irrigated paddy rice would be 902,000t, that is equivalent to 189,000ha with an yield of 4.78t/ha.
- 5) When cropping intensity reach 1.72 (or cycles), irrigated paddy area would be 110,000ha in 2015.

Cropped area of irrigated crops can be summarized as shown in Table below. Among irrigated crops, paddy rice will share the largest area, and followed by vegetables and sugarcane.

Table 2.2-5-8 Irrigation Area of Each Irrigated Crop in 2005 and 2015

Irrigated Crops	1995	2005	2015	Annual Growth Ratio
Paddy Rice	22,000 ha	64,000 ha	110,000 ha	8.38%
Vegetables	27,000	51,100	96,830	6.59%
Sugarcane	21,310	30,000	42,350	3.49%
Banana	5,600	7,350	9,650	2.76%
Pineapple	3,500	7,760	17,230	8.29%
Total	79,410	160,210	276,060	6.43%

(Note) Pineapple is irrigated only for 22.6% of total pineapple area.

Table 2.2-5-9 Projection of Paddy Rice Cultivation by Department in 2005 and 2015

Cropped Area		(unit: ha)											
Department	Present Paddy Cultivation				2005 Rice Cultivation				2015 Rice Cultivation				
	Rainfed Paddy	Irrigated Paddy			Rainfed Paddy	Irrigated			Rainfed Paddy	Irrigated			
		Total	Double	Sigle		Total	Double	Sigle		Total	Double	Sigle	
1 Abengourou	4,690	30	27	3	7,590	90	40	50	10,390	150	110	40	
2 Abidjan	530	10		10	860	30	10	20	1,170	50	40	10	
3 Aboisso	1,810	10		10	2,930	30	10	20	4,010	50	40	10	
4 Adiake	800	10		10	1,290	30	10	20	1,770	50	40	10	
5 Adzope	3,260	20		20	5,270	60	30	30	7,220	100	70	30	
6 Agboville	4,890	40	33	7	7,910	120	60	60	10,840	200	140	60	
7 Agnibilekrou	1,820	0		0	2,940	0	0	0	4,030	0	0	0	
8 Alepe	640	10		10	1,040	30	10	20	1,420	50	40	10	
9 Bangolo	12,780	290		290	20,670	840	390	450	28,320	1,450	1,040	410	
10 Beoumi	1,940	240	20	220	3,140	700	330	370	4,300	1,200	860	340	
11 Biankouma	22,800	350		350	36,880	1,020	480	540	50,520	1,750	1,260	490	
12 Bocanda	7,200	0		0	11,650	0	0	0	15,950	0	0	0	
13 Bondoukou	1,380	120	30	90	2,230	350	160	190	3,060	600	430	170	
14 Bongouanou	16,720	50	50	0	27,050	150	70	80	37,050	250	180	70	
15 Bouaflé	13,570	140		140	21,950	410	190	220	30,070	700	500	200	
16 Bouake	2,800	410	406	4	4,530	1,190	560	630	6,200	2,050	1,470	580	
17 Bouna	4,070	100		100	6,580	290	140	150	9,020	500	360	140	
18 Boundiali	9,920	1,710	384	1,326	16,050	4,970	2,340	2,630	21,980	8,550	6,140	2,410	
19 Dabakala	3,910	250	114	136	6,320	730	340	390	8,660	1,250	900	350	
20 Dabou	770	10		10	1,250	30	10	20	1,710	50	40	10	
21 Daloa	13,960	280	76	204	22,580	810	380	430	30,930	1,400	1,010	390	
22 Danané	34,200	780		780	55,320	2,270	1,060	1,210	75,780	3,900	2,800	1,100	
23 Daoukro	6,300	70	62	8	10,190	200	90	110	13,960	350	250	100	
24 Dimbokro	2,340	100	93	7	3,790	290	140	150	5,180	500	360	140	
25 Divo	21,110	30		30	34,150	90	40	50	46,780	150	110	40	
26 Duekoué	14,770	300		300	23,890	870	410	460	32,730	1,500	1,080	420	
27 Ferkessedougou	3,260	2,180	200	1,980	5,270	6,340	2,980	3,360	7,220	10,900	7,820	3,080	
28 Gagnoa	25,390	220	127	93	41,070	640	300	340	56,260	1,100	790	310	
29 Grand Bassam	290	10		10	470	30	10	20	640	50	40	10	
30 Grand Lahou	290	10		10	470	30	10	20	640	50	40	10	
31 Guiglo	22,970	470		470	37,150	1,370	640	730	50,900	2,350	1,690	660	
32 Issia	9,740	190		190	15,750	550	260	290	21,580	950	680	270	
33 Jacqueville	120	0		0	190	0	0	0	270	0	0	0	
34 Katiola	4,890	320	160	160	7,910	930	440	490	10,840	1,600	1,150	450	
35 Korhogo	66,760	4,750	2,471	2,279	108,000	13,810	6,480	7,330	147,940	23,750	17,050	6,700	
36 Lakota	6,580	10		10	10,640	30	10	20	14,580	50	40	10	
37 Man	36,070	810		810	58,340	2,360	1,110	1,250	79,920	4,050	2,910	1,140	
38 Mankono	10,760	580		580	17,400	1,690	790	900	23,840	2,900	2,080	820	
39 M'bahiakro	2,280	280		280	3,690	810	380	430	5,050	1,400	1,010	390	
40 Odienne	13,030	730		730	21,080	2,120	990	1,130	28,870	3,650	2,620	1,030	
41 Oumé	15,320	130		130	24,780	380	180	200	33,950	650	470	180	
42 Sakassou	1,270	280	275	5	2,050	810	380	430	2,810	1,400	1,010	390	
43 San-Pedro	13,500	240	110	130	21,840	700	330	370	29,910	1,200	860	340	
44 Sassandra	13,060	220		220	21,130	640	300	340	28,940	1,100	790	310	
45 Seguela	8,780	480		480	14,200	1,400	660	740	19,450	2,400	1,720	680	
46 Sinfra	9,050	90		90	14,640	260	120	140	20,050	450	320	130	
47 Soubre	38,190	650	160	490	61,780	1,890	890	1,000	84,630	3,250	2,330	920	
48 Tabou	6,920	120		120	11,190	350	160	190	15,330	600	430	170	
49 Tanda	1,870	150		150	3,020	440	210	230	4,140	750	540	210	
50 Tengrela	3,110	510		510	5,030	1,480	690	790	6,890	2,550	1,830	720	
51 Tiassale	620	10		10	1,000	30	10	20	1,370	50	40	10	
52 Tiebissou	1,290	210	205	5	2,090	610	290	320	2,860	1,050	750	300	
53 Touba	17,910	480		480	28,970	1,400	660	740	39,680	2,400	1,720	680	
54 Toulepleu	4,600	90		90	7,440	260	120	140	10,190	450	320	130	
55 Toumodi	1,470	380	379	1	2,380	1,110	520	590	3,260	1,900	1,360	540	
56 Vavoua	8,880	170		170	14,360	490	230	260	19,680	850	610	240	
571 Yamoussoukro1	1,660	1,480	1,475	5	2,690	4,310	2,020	2,290	3,680	7,400	5,310	2,090	
572 Yamoussoukro2	1,140	290	290	0	1,840	840	390	450	2,530	1,450	1,040	410	
58 Zuenoula	9,950	100		100	16,090	290	140	150	22,050	500	360	140	
Total	570,000	22,000	7,147	14,853	922,000	64,000	30,000	34,000	1,263,000	110,000	79,000	31,000	
		592,000				986,000				1,373,000			

Yield of Food Crops (t/ha)

Yield (t/ha) 1.4 6.4 3.2 1.94 9.56 4.78 1.94 9.56 4.78

5.2 Livestock Framework in 2015

Framework of livestock development will be set as follows:

- Livestock is planned to extend with 3.8% growth rate annually through the country.
- Livestock will be increased to almost double (2.108 times) in 2015.
- Livestock development will be extremely concentrated into northern area, as in Savanes Region.
- In Savanes Region, farming type agriculture is not so encouraged and farmland will be limited within 30% of the area, so that livestock development will be major earnings in this region.
- Grazing density will exceed allowable level in Tengrela as shown in Table 2.2-5-10, if no measures are taken.

Figure 2.2-5-2 Livestock Holdings by Agricultural Household

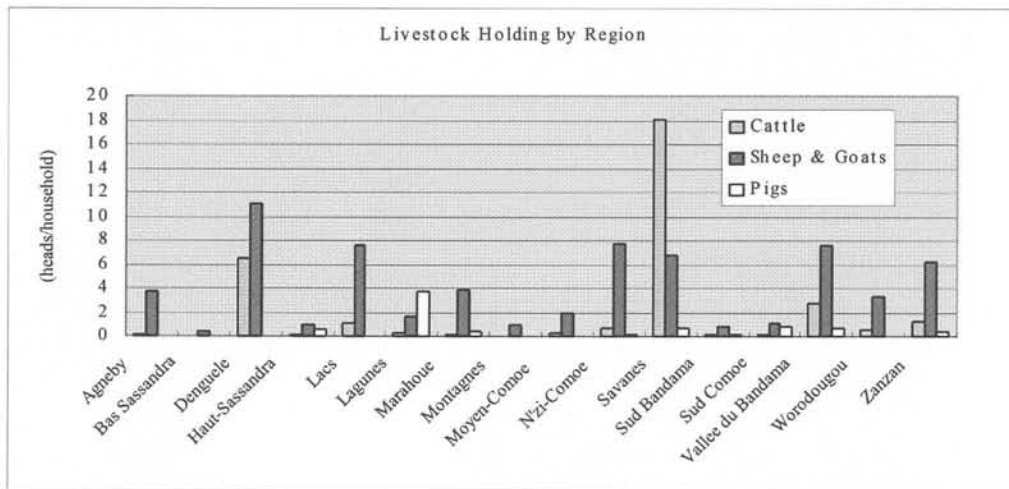
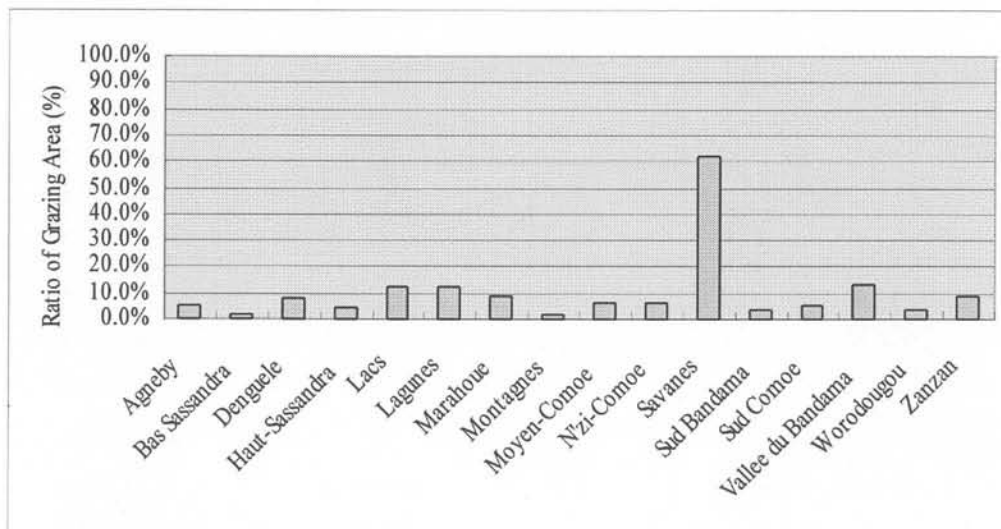


Table 2.2-5-3 Necessary Grazing Area and Ratio by the Region



5.3 Fishery Framework in 2015

Fishery framework is set to achieve self-sufficiency at per-capita 17 kg of fish consumption supplied by national product. In order to achieve this supply product has to reach 473,000 t in 2015.

When freshwater fishery is exploited to 2/3 of potential or 170kg/ha/year, it is expected to produce 59,000 t/year of fish from total water bodies of 347,700ha. Marine and lagoon fisheries are expected to realize a production of 133,000t per year. On the other hand, aquaculture is expected to raise productivity level from 4t/ha/year to 8t/ha/year by the Agricultural Master Plan. If aquaculture is able to realize production of remaining 281,000 t with a productivity of 8t/ha/year, it needs to expand fishpond to about 35,000ha.

Fish Production Plan by Aquaculture

Necessary Fish production in 2015 28,030,000 habit x 17 kg/capita/yr =	473,000 t/yr
Expected Production by Natural Fishery	
Marine fishery	133,000 t/yr
Fresh water fishery	
$347,700\text{ha} \times 250 \text{ kg/ha} \times 2/3 = 347,000 \times 170 \text{ kg/ha} =$	59,000 t/yr
Total Production	192,000 t/yr
Necessary Production by Aquaculture	281,000 t/yr
Necessary Fishpond	
Productivity : 8 t/ha	
Fishpond : $281,000 \text{ t/ha} / 8 \text{ t/ha} =$	35,000 ha

For realizing such extensive fishpond, lowland is the first target to develop fishpond. It is therefore, subject to flooding area is the target area to develop fishpond. Such area can be found adjacent area to the low lying paddy prevailing area. It is supposed to able to develop fishpond in accordance with the proportion of paddy area distribution in each department.

Fish pond will be developed as shown in Figure 2.2-5-4. Details are in Table 2.2-5-11.

Figure 2.2-5-4 Fishpond Development Direction by Regions in 2015

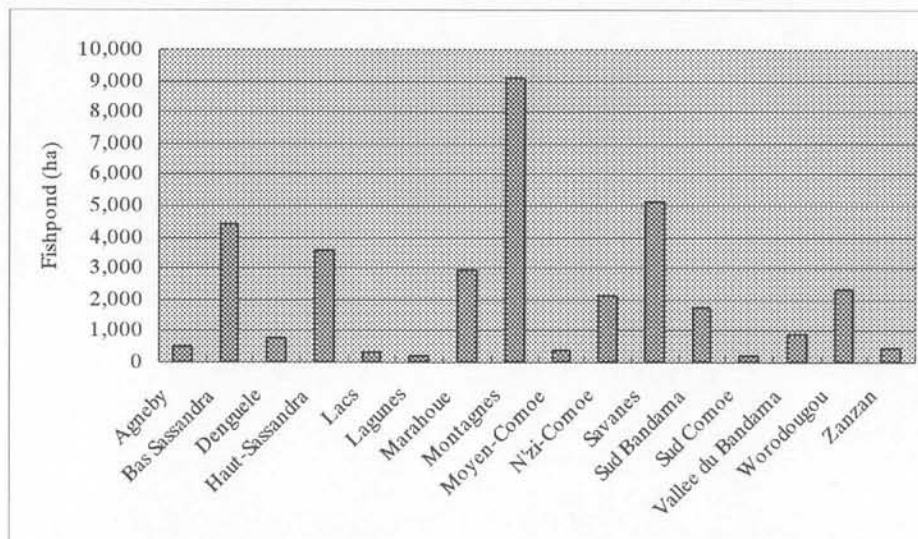


Table 2.2-5-11 Fishpond Development by Department and Region in 2015

Region	Department	Fishpond in 1995 (ha)	Fishpond in 2015 (ha)
1 Agneby	5 Adzope	45	200
1 Agneby	6 Agboville		300
2 Bas Sassandra	43 San-Pedro	30	830
2 Bas Sassandra	44 Sassandra		800
2 Bas Sassandra	47 Soubre		2,350
2 Bas Sassandra	48 Tabou		420
3 Denguele	40 Odiene		800
4 Haut-Sassandra	21 Daloa	97	860
4 Haut-Sassandra	28 Gagnoa		1,560
4 Haut-Sassandra	32 Issia		600
4 Haut-Sassandra	56 Vavoua		550
5 Lacs	52 Tiebissou	10	80
5 Lacs	55 Toumodi		90
5 Lacs	571 Yamoussoukro1	20	100
5 Lacs	572 Yamoussoukro2		70
6 Lagunes	2 Abidjan		30
6 Lagunes	8 Alepe	11	40
6 Lagunes	20 Dabou		50
6 Lagunes	30 Grand Lahou		20
6 Lagunes	33 Jacquerville		10
6 Lagunes	51 Tiassale		40
7 Marahoue	15 Bouaflé		830
7 Marahoue	41 Oume		940
7 Marahoue	46 Sinfra		560
7 Marahoue	58 Zuenoula		610
8 Montagnes	9 Bangolo	10	780
8 Montagnes	11 Biankouma	10	1,400
8 Montagnes	22 Danane	20	2,100
8 Montagnes	26 Duekoue	10	910
8 Montagnes	31 Guiglo	20	1,410
8 Montagnes	37 Man	20	2,210
8 Montagnes	54 Toulepleu	10	280
9 Moyen-Comoe	1 Abengourou		290
9 Moyen-Comoe	7 Agnibilekrou		110
10 N'zi-Comoe	12 Bocanda		440
10 N'zi-Comoe	14 Bongouanou	3.5	1,030
10 N'zi-Comoe	23 Daoukro		390
10 N'zi-Comoe	24 Dimbokro	10.68	140
10 N'zi-Comoe	39 M'bahiakro		140
11 Savanes	18 Boundiali		610
11 Savanes	27 Ferkessedougou		200
11 Savanes	35 Korbogo		4,100
11 Savanes	50 Tengrela		190
12 Sud Bandama	25 Divo		1,300
12 Sud Bandama	36 Lakota		400
13 Sud Comoe	3 Aboisso	11	110
13 Sud Comoe	4 Adiake		50
13 Sud Comoe	29 Grand Bassam		20
14 Vallee du Bandama	10 Beoumi		120
14 Vallee du Bandama	16 Bouake	12	170
14 Vallee du Bandama	19 Dabakala		240
14 Vallee du Bandama	34 Katiola		300
14 Vallee du Bandama	42 Sakassou		80
15 Worodougou	38 Mankono		660
15 Worodougou	45 Seguela		540
15 Worodougou	53 Toubia		1,100
16 Zanzan	13 Bondoukou		80
16 Zanzan	17 Bouna		250
16 Zanzan	49 Tanda		110
1 Agneby		45	500
2 Bas Sassandra		30	4,400
3 Denguele		0	800
4 Haut-Sassandra		97	3,570
5 Lacs		30	340
6 Lagunes		11	190
7 Marahoue		0	2,940
8 Montagnes		100	9,090
9 Moyen-Comoe		0	400
10 N'zi-Comoe		14	2,140
11 Savanes		0	5,100
12 Sud Bandama		0	1,700
13 Sud Comoe		11	180
14 Vallee du Bandama		12	910
15 Worodougou		0	2,300
16 Zanzan		0	440
Total		350	35,000

(Note) Fishpond area is expanded in accordance with proportion of paddy area.

CHAPTER 6 WATER RESOURCES DEVELOPMENT PLANS AND COST FOR AGRICULTURE

6.1 Development Cost of the Project

Development cost of agricultural project has been studied in several previous studies. Among those studies, most preferable study would be by "Integrated Rural Development Project in the Middle Basin of N'Zi". This study studied two main stream low dams and 28 tributary dams for irrigation in the middle reach of the N'Zi River. Table 2.2-6-1 shows the unit cost of land consolidation for paddy irrigation field. According to the average land consolidation fee of 4 projects, namely Dienzou, Yanzou, Eholie and Atofou, which are tributary development dams, unit cost of land consolidation fee is estimated at 6.886 million FCFA/ha or US\$11,900/ha.

Table 2.2-6-1 Unit Cost of Land Consolidation by Previous Study

(unit:1000FCFA/ha)						
Projects	Area (ha)	Foreign	Local	Total (w/o Tax)	Tax	Total (w/ Tax)
1) M'Bahiakro	453	2,811	1,695	4,507	1,127	5,633
2) Dienzou	110	4,617	2,836	7,453	1,863	9,316
3) Yanmon	80	4,180	2,639	6,819	1,705	8,523
4) Eholie	130	3,909	2,430	6,339	1,585	7,924
5) Atofou	200	3,957	2,554	6,510	1,628	8,138
Average (1)-5)		3,895	2,431	6,326	1,582	7,907
Average (2)-5)		4,166	2,615	6,780	1,695	8,475
Unit Cost of Land Cosolidation including Land Acquisition						
Projects	Area (ha)	Foreign	Local	Total (w/o Tax)	Tax	Total (w/ Tax)
1) M'Bahiakro	453	2,811	1,695	4,506		
2) Dienzou	110	4,617	2,948	7,565		
3) Yanmon	80	4,180	2,853	7,033		
4) Eholie	130	3,909	2,453	6,362		
5) Atofou	200	3,957	2,630	6,587		
Average (1)-(5)		3,895	2,516	6,411		
Average (2)-(5)		4,166	2,721	6,887		

(Source) Integrated Rural Development Project in the Middle Basin of N'Zi, August 1995, JICA

(Note) M'Bahiakro is a main stream low dam and other four dams are tributary dams.

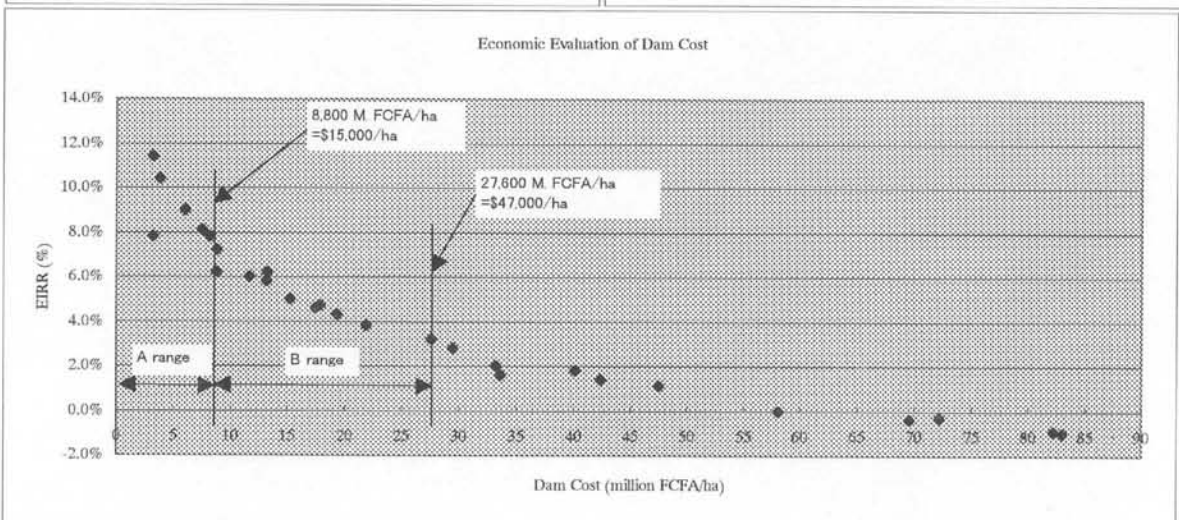
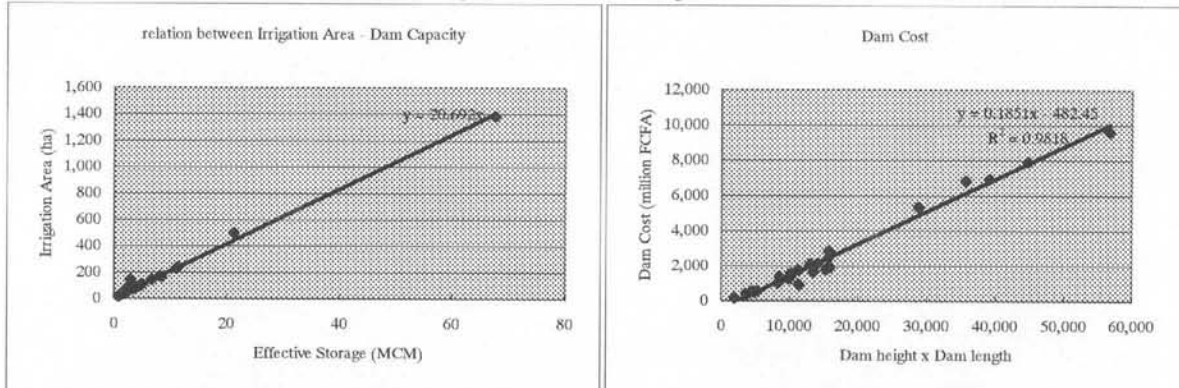
There is very close relation between irrigable area and dam capacity as shown in the upper left figure in Table 2.2-6-2. This figure suggests that each 1.0 MCM capacity of dam can irrigate about 20ha, so that 5 MCM capacity is required for 100 ha irrigation. On the other hand, development cost varies by the development sites, and its cost can not be estimated without considering dam height and length as shown in the figure of dam cost in Table 2.2-6-2. This means that it is necessary to use topographical maps with a scale of 1:50,000 or more detail one for estimating dam cost based on dam height and length.

From economical viewpoint, 28 sites have been evaluated using EIRR. Projects have been classified into three groupes A, B and C. "A" is evaluated more than 7% of EIRR, and "B" is 3% to 7%, and C is less than 3%. If, projects are to be more than 7% of EIRR, dam cost is to be less than 8.800 million FCFA/ha or US\$15,000/ha. If projects are to be more than 3% of EIRR, dam cost is to be less than 27.600 million FCFA/ha or US\$47,000/ha.

Table 2.2-6-2 Economic Evaluation of Reservoir Development in the Middle Valley of N'Zi

Dam	CA (km2)	Effect. Storage (MCM)	Dead (MCM)	Total Storage (MCM)	Dam Height (m)	Dam Length (m)	H*L	Irrigation Area (ha)	Development Area (ha)	Project Cost (million FCFA)	Land Consolidation (million FCFA)	Dam Cost (million FCFA)	Dam Unit Cost (million FCFA/ha)	EIRR	Evaluation
1 Yeboue N'zue	153	6.759	0.612	7.371	21	2,700	56,700	138	160	10,707	1,102	9,605	69.601	-0.4%	C
2 Sounglou	261	11.510	1.044	12.554	22	1,780	39,160	235	270	8,793	1,859	6,934	29.506	2.8%	C
3 Toualakoun	91	4.016	0.364	4.380	24	1,490	35,760	82	95	7,461	654	6,807	83.012	-1.0%	C
4 Seke Gloulouba	253	11.167	1.012	12.179	13	1,230	15,990	228	260	3,660	1,791	1,869	8.197	7.8%	A
5 Katie	552	21.305	2.208	23.513	14	970	13,580	497	500	5,060	3,444	1,616	3.252	11.4%	A
6 Mandia	107	4.702	0.428	5.130	22	2,040	44,880	96	110	8,650	758	7,892	82.208	-0.9%	C
7 Mo	36	2.498	0.144	2.642	11	330	3,630	51	60	798	413	385	7.549	8.1%	A
8 Akpobo	21	1.420	0.084	1.504	19	690	13,110	29	35	2,335	241	2,094	72.207	-0.3%	C
9 Dienzou	87	2.422	0.346	2.768	14.2	720	10,224	78	110	2,120	758	1,362	17.462	4.6%	B
10 Djamala	26	1.812	0.102	1.914	18	790	14,220	37	40	2,425	275	2,150	58.108	0.0%	C
11 Baa	967	67.737	3.868	71.605	24	1,200	28,800	1,383	1,590	16,292	10,950	5,342	3.863	10.4%	A
12 Yanmon	39	2.514	0.156	2.670	16.1	620	9,982	56	80	1,779	551	1,228	21.929	3.8%	B
13 Pokoukla N'zueba	26	1.812	0.104	1.916	8	480	3,840	37	40	602	275	327	8.838	7.2%	A
14 Bassia	26	1.812	0.104	1.916	16	550	8,800	37	40	1,506	275	1,231	33.270	2.0%	C
15 Sokpa Yanmien	47	3.282	0.188	3.470	22	720	15,840	67	75	3,357	517	2,840	42.388	1.4%	C
16 Abode	48	3.379	0.192	3.571	8	1,430	11,440	69	80	1,464	551	913	13.232	6.2%	B
17 N'blinzueba	25	1.763	0.100	1.863	13	350	4,550	36	40	824	275	549	15.250	5.0%	B
18 Baya	524	8.326	2.096	10.422	14	600	8,400	170	200	2,405	1,377	1,028	6.047	9.0%	A
19 Baa	26	1.469	0.104	1.573	16	560	8,960	37	35	1,486	241	1,245	33.649	1.6%	C
20 N'Ziminou	97	2.988	0.388	3.376	9	550	4,950	139	70	936	482	454	3.266	7.8%	A
21 Eholie	65	4.620	0.260	4.880	16	965	15,440	91	130	2,655	895	1,760	19.341	4.3%	B
22 Bondasse	73	5.094	0.292	5.386	19	450	8,550	104	120	2,199	826	1,373	13.202	5.8%	B
23 N'diti	11	0.784	0.044	0.828	6	330	1,980	16	20	278	138	140	8.750	6.2%	B
24 Kpokpla	23	1.616	0.092	1.708	18	570	10,260	33	40	1,843	275	1,568	47.515	1.1%	C
25 Atofou	110	8.460	0.440	8.900	17.3	910	15,743	165	200	3,303	1,377	1,926	11.673	6.0%	B
26 Damia	97	6.808	0.388	7.196	19	830	15,770	139	160	3,580	1,102	2,478	17.827	4.7%	B
27 Songan	30	2.106	0.120	2.226	18	630	11,340	43	50	2,070	344	1,726	40.140	1.8%	C
28 Ebinolo	14	0.980	0.056	1.036	11	480	5,280	20	25	724	172	552	27.600	3.2%	B
Average	137	6.90	0.55	7.45	16.0	892		147	166	3,547	31,918	67,394	28.532	4.3%	
Total								4,113	4,635	99,312			83,012		

(Source) Etude du Projet de Developpement Rural Integre de la Moyenne Vallee du NZi, JICA, August 1995



6.2 Development Plan and Cost Agricultural Project

Based on above development unit cost, agricultural development cost can be estimated at 3,017 billion FCFA by 2015 as show in Table below:

Table 2.2-6-3 Agricultural Development Cost

Year	1995	2005	2015	Total	Remarks
Irrigation Area (ha)					
Surface Water Development					
Paddy Rice	22,000	64,000	110,000		assumed at 1/3 of 2015 in 2005
Sugarcane	21,310	30,000	42,350		
Banana	5,600	7,350	9,650		
Pineapple	3,500	7,760	17,230		
Fishpond	350	11,500	35,000		
Total	52,760	120,610	214,230	214,230	
Groundwater Development					
Vegetables	27,000	51,100	96,830		
Total	27,000	51,100	96,830	96,830	
Incremental Irrigated Area (ha)					
Rice and others	0	67,850	93,620	161,470	
Vegetables	0	24,100	45,730	69,830	
Total	0	91,950	139,350	231,300	
Water Resources Development Cost (million FCFA)					
Rice and others	0	597,080	823,856	1,420,936	Cost counted in G.Water Development.
Vegetables	0	0	0	0	
Total	0	597,080	823,856	1,420,936	
Farmland Development Cost (million FCFA)					
Rice and others	0	468,165	645,978	1,114,143	
Vegetables	0	166,290	315,537	481,827	
Total	0	634,455	961,515	1,595,970	
Total Development Cost (million FCFA)					
Rice and others	0	1,065,245	1,469,834	2,535,079	
Vegetables	0	166,290	315,537	481,827	
Total	0	1,231,535	1,785,371	3,016,906	

(Note) Unit development cost is 8.8 million FCFA/ha for water resources developments, and 6.9 million FCFA/ha for farmland.

6.3 Proposed Agricultural Development Project

Development plans of agriculture are deliberated and nominated in the development program by DP, MINAGRA, and the nominated development projects are listed and reported as well as on-going projects in the publication, namely "Catalog of the Projects". The latest one is under preparation by DP as of November 1999, and it will be available in early 2000. However, implementation programs of the nominated development projects are always subject to revision due to instability of financial situation. Financial situation of the national budget is standing not only on national revenue but external financial aid so that the nominated projects are usually behind in implementation or in schedule.

Taking the main subjects of this study, water resources management and development, into consideration, development projects will be considered only for water resources concerned. These priority projects are listed in Table 2.2-6-4. Priority projects are 8 projects or 12,247 ha for paddy rice irrigation development and 2 rehabilitation projects or 8,000ha for sugarcane. Locations of priority projects are shown in Figure 2.2-6-1 to Figure 2.2-6-4.

Table 2.2-6-4 Priority Projects on Agricultural Development

Project Category Project Name	Location		F/S Study	Project Component	Irrigation		Project Cost (million FCFA)	Agencies
	Region	Department			Crops	Area (ha)		
Paddy Rice Development Projects								
1 Kenedy Round II (KR II) (A1.86.99.19.1)	Whole Country		not yet	13 dams	Paddy Rice	1,300 *1)	20,280 *2)	PNR
2 PL480	Whole Country		not yet	30 dams	Paddy Rice	3,000 *1)	46,800 *2)	PNR
3 Development of Rice Irrigation in Centre and Centre-Nord (A1.95.52.15.1)	Vallee du Bandam & Lac	Sakassou, Katiola, Dabakala, Bouake, Yamoussoukro	1994	Paddy Rice Irrigation	Paddy Rice	2,151	33,556 *2)	PNR
4 Integrated Rural Development Project in the Middle Valley of N'Zi (B1.00.52.15.1)	N'Zi-Comoe	Bocanda, Bongouanou, Dimbokro, M'Bahiakro	1995	M'Bahiakro low dam, Bocanda low dam & 13 dams	Paddy Rice	4,638	60,960	PNR
5 Integrated Rural Development Project in San-Pedro Plain	Bas Sassandra	San-Pedro	1999	Canal 31.4km	Paddy Rice	575	6,766	PNR
6 Ifau and Yeye Riveer Integrated Development Plan in Daoukro and Quelle Cities and Surrounding Area.	N'Zi-Comoe	Daoukro	not yet	Rehabilitation 2dams, Irrigation 150ha, Urban water 2 cities	Paddy Rice	150	2,340 *2)	PNR
7 Pump Irrigation in the Downstream Area of Taabo Dam in Tiassale	Lagunes	Tiassale	not yet	Pump Irrigation 300ha (10sites)	Paddy Rice	300	4,000	PNR
8 Karangoua-Wamo Dam Irrigation Project in Bondoukou	Zanzan	Bondoukou	not yet	Karngoua-Wamo dam (H=11,28m, L=615m, V=5.80MCM)	Paddy Rice	133	2,075 *2)	PNR
Sub-Total						12,247	176,776	
Sugarcane Development Projects								
1 Marabadiassa	Vallee du Bandam	Katiola	not yet	Rehabilitation: 3,000ha, Rehabilitation: Pumps, Sugarcane Rehabilitation: 1 sugar factory		3,000	46,800 *2)	
2 Serebou	N'Zi-Comoe	M'Bahiakro	not yet	Rehabilitation: 5,000ha, Rehabilitation: Pumps, Sugarcane Rehabilitation: 1 sugar factory		5,000	78,000 *2)	
Sub-Total						8,000	124,800	
Total						20,247	301,576	

(Sources) Feasibility Study Report, Catalog of the Projects, PNR Information, and Assumption of this study.

(Note) *1): assumed at 100ha per one dam, *2): assumed at 15.6 million FCFA/ha (Water=8.8 million FCFA/ha, Land consolidation=6.9 million FCFA/ha)

Figure 2.2-6-1 Location Map of the Priority Projects of Agriculture

