

Bảng

Bảng 1.1 Các thành viên của Đoàn Nghiên cứu và Ban Giám sát

	Name	Work Assignment
(1)	Study Team	
1	Shigeo OHNUMA /Norizo FUJITA	Team Leader
2	Masaki ITO	Deputy Team Leader/Water Resources Development and management
3	Toshikatsu IMAI	River Engineer (1)
4	Takuji KONO	River Engineer (2)
5	A.M.SUTMULLER /T.H.op ten NOORT	Hydrologist (1)
6	Akihiro MATSUDA	Hydrologist (2)
7	Hideo OHHATA	Sabo Planner
8	C.C. SEKINGTON	Disaster Prevention Planner
9	Tomoyasu KITA	Facility Design Engineer
10	Takuji KONO	Dam Design Engineer
11	Akihiro TAKATO	Construction Planner/Cost Estimate
12	Noritoshi MAEHARA	Economist
13	I.B.VAN BON / C.C. SEKINGTON	Water Use Planner
14	Takatoshi YAMAZAKI	Agronomist
15	Naoto MORIOKA	Agro-economist
16	Kuninobu NODA	Irrigation Planner (1)
17	J.S.T.FEKKES	Irrigation Planner (2)
18	Norihiko INOUE	Social Environmentalist
19	Hitoshi SAKAI	Natural Environmentalist
20	Kenichi SHIBATA	Satellite Image Analyst (1)
21	Chiyo KIGASAWA	Satellite Image Analyst (2)
22	Pucal YANG	Geologist /Geo-mechanical Engineer
23	Takaharu YAMAGUCHI	Coordinator
24	Toshio TSUKANO / Takashi HASHIMOTO	Interpreter
(2)	Advisory Committee	
1	Tsuneo UESAKA	Chairman
2	Yoshihiro ISHIBASHI / Yoshinao MORI	Member
3	Hiroshi OKUDAIRA	Member
4	Akira NIWA	Member
5	Mutsuya MORI	Member

Bảng 1.2 Các thành viên của Ban chỉ đạo dự án

	Name	Position
Chairman / Member	Nguyen Dinh Thinh	Vice Minister of MARD
Member	Pham Xuan Su	Director of Water Resources and Hydraulic Works Department, MARD
Member	To Trung Nghia	Director of Institute of Water Resources Planning, MARD
Member	Bui Nguyen Hong	Vice Director of Flood Control and Dyke Management Department, MARD
Member	Tran Dinh Hoi	Vice Director of Institute of Water Resources Research, MARD
Member	Vu Nang Dung	Director of National Institute for Agriculture Planning and Projection
Member	Nguyen Hong Toan	General Secretary of Vietnam National Mekong Committee, MARD
Member	Le Kien	Representative of Ministry of Planning and Investment

Bảng 2.1 Khu vực và quản lý hành chính địa phương

City & District	Hue Province (1998)						Project Area (1995)			
	Lang Area			Local Administration Unit			Area		Local Adm. Unit	
	ha	Proportion	sq. km	Communes	Towns	Average Size	ha	sq. km	Communes	Total
1 City Hue	6,777 ha	1.4%	68 sq. km	5	20	3 sq. km	-	-	5	5
2 Dist. Huong Dien	107,130 ha	21.4%	1,071 sq. km	15	1	67 sq. km	-	-	3	7
3 Dist. Quang Dien	15,700 ha	3.1%	157 sq. km	10	1	14 sq. km	-	-	4	7
4 Dist. Huong Tra	40,270 ha	8.0%	403 sq. km	15	1	25 sq. km	-	-	10	10
5 Dist. Phu Vang	26,320 ha	5.3%	263 sq. km	21	-	13 sq. km	-	-	3	10
6 Dist. Huong Thuy	49,660 ha	9.9%	497 sq. km	11	1	41 sq. km	-	-	9	12
7 Dist. Phu Loc	69,240 ha	13.8%	692 sq. km	17	1	38 sq. km	-	-	1	9
8 Dist. A Luoi	115,943 ha	23.1%	1,159 sq. km	20	1	55 sq. km	-	-	-	-
9 Dist. Nam Dong	69,880 ha	14.0%	699 sq. km	10	1	64 sq. km	-	-	0	-
Total	500,920 ha	100%	5,009 sq. km	124	27	33 sq. km	0	0	35	60

Source: Interim Report of Feasibility Study, December 1999.

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City & District	Hue Province (2000)						Project Area (2000)				
	Lang Area				Local Administration Unit			Area		Local Adm. Unit	
	ha	*1	*2	sq. km	Communes	Towns	Average Size	ha	sq. km	Communes	Towns
1 City Hue	7,099 ha	1.4%	4.8%	71 sq. km	5	20	3 sq. km	-	-	5	-
2 Dist. Huong Dien	95,375 ha	18.9%	-11.0%	954 sq. km	15	1	60 sq. km	-	-	6	-
3 Dist. Quang Dien	16,307 ha	3.2%	3.9%	163 sq. km	10	1	15 sq. km	-	-	5	-
4 Dist. Huong Tra	52,089 ha	10.3%	29.3%	521 sq. km	15	1	33 sq. km	-	-	15	-
5 Dist. Phu Vang	28,032 ha	5.5%	6.5%	280 sq. km	19	1	14 sq. km	-	-	5	-
6 Dist. Huong Thuy	45,734 ha	9.0%	-7.9%	457 sq. km	11	1	38 sq. km	-	-	8	-
7 Dist. Phu Loc	72,809 ha	14.4%	5.2%	728 sq. km	17	1	40 sq. km	-	-	2	-
8 Dist. A Luoi	122,902 ha	24.3%	6.0%	1,229 sq. km	20	1	59 sq. km	-	-	0	-
9 Dist. Nam Dong	65,052 ha	12.9%	-6.9%	651 sq. km	10	1	59 sq. km	-	-	0	-
Total	505,399 ha	100%	101%	5,054 sq. km	122	28	34 sq. km	0	0	46.0	0

Note; Land area compiled in the statistics was changed in 20000 from 5009.22 sq. km to 5,053.99 sq. km.

*1: Proportion against total area of province. *2: Proportion against area of each unit in 1998.

Source: Statistical Yearbook 2000, Thua Thien Hue Province.

Bảng 2.2 Dân số của tỉnh Thừa Thiên Huế

	1998												
	Area		Population			Density	Population		Local Adm. Unit		Average Size of Adm. Unit		
	ha	sq. km	Total	Urban	Rural	per sq. km	Male	Female	Com-munes	Towns	Total	Urban	Rural
1 City Hue	6,777	68	296,019	-	-	4,170	-	-	5	20	11,841	-	-
2 Dist. Phong Dien	107,130	1,071	100,612	-	-	105	-	-	15	1	6,288	-	-
3 Dist. Quang Dien	15,700	157	91,102	-	-	559	-	-	10	1	8,282	-	-
4 Dist. Huong Tra	40,270	403	110,566	-	-	212	-	-	15	1	6,910	-	-
5 Dist. Phu Vang	26,320	263	168,857	-	-	602	-	-	21	-	8,041	-	-
6 Dist. Huong Thuy	49,660	497	90,314	-	-	197	-	-	11	1	7,526	-	-
7 Dist. Phu Loc	69,240	692	146,687	-	-	201	-	-	17	1	8,149	-	-
8 Dist. A Luoi	115,943	1,159	34,731	-	-	28	-	-	20	1	1,654	-	-
9 Dist. Nam Dong	69,880	699	22,608	-	-	35	-	-	10	1	2,055	-	-
Total	500,920	5,009	1,061,496	0	0	210	210	0	124	27	7,030	-	-

Source: Interim Report of Feasibility Study, December 2001.

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	Hue Province (2000)												
	Area		Population			Density	Population		Local Adm. Unit		Average Size of Adm. Unit		
	ha	sq. km	Total	Urban	Rural	per sq. km	Male	Female	Com-munes	Towns	Average	Towns	Rural
1 City Hue	7,099	71	298,208	242,146	56,062	4,201	146,308	151,900	5	20	11,928	12,107	11,212
2 Dist. Phong Dien	95,375	954	100,969	6,062	94,907	106	48,893	52,076	15	1	6,311	6,062	6,327
3 Dist. Quang Dien	16,307	163	91,037	10,005	81,032	558	44,540	46,076	10	1	8,276	10,005	8,103
4 Dist. Huong Tra	52,089	521	111,480	7,644	103,836	214	55,758	55,722	15	1	6,968	7,644	6,922
5 Dist. Phu Vang	28,032	280	173,311	19,133	154,178	618	86,008	87,303	19	1	8,666	19,133	8,115
6 Dist. Huong Thuy	45,734	457	89,410	11,982	77,428	196	43,593	45,817	11	1	7,451	11,982	7,039
7 Dist. Phu Loc	72,809	728	145,286	10,830	134,456	200	71,810	73,476	17	1	8,071	10,830	7,909
8 Dist. A Luoi	122,902	1,229	35,402	5,128	30,274	29	17,639	17,763	20	1	1,686	5,128	1,514
9 Dist. Nam Dong	65,052	651	21,059	3,274	17,785	32	10,615	10,444	10	1	1,914	3,274	1,779
Total	505,399	5,054	1,066,162	316,204	749,958	211	525,164	540,577	122	28	7,108	11,293	6,147

Source: Statistical Yearbook 2000, Thua Thien Hue Province.

Bảng 2.3 Tốc độ tăng trưởng dân số

(1) Growth Rate by Urban and Rural

	Total		Urban		Rural	
	Population	Annual Rate	Population	Annual Rate	Population	Annual Rate
1990	900,927	-	238,221	-	662,706	-
1991	919,482	2.06%	240,745	1.06%	678,737	2.42%
1992	937,452	1.95%	243,295	1.06%	694,157	2.27%
1993	954,839	1.85%	245,873	1.06%	708,966	2.13%
1994	971,398	1.73%	248,478	1.06%	722,920	1.97%
1995	987,278	1.63%	257,045	3.45%	730,233	1.01%
1996	1,002,725	1.56%	272,147	5.88%	730,578	0.05%
1997	1,017,916	1.51%	281,705	3.51%	736,211	0.77%
1998	1,033,268	1.51%	294,458	4.53%	738,810	0.35%
1999	1,049,460	1.57%	309,100	4.97%	740,360	0.21%
2000	1,066,162	1.59%	316,204	2.30%	749,958	1.30%
Average 1995-2000		1.55%	288,443	4.23%	737,692	0.53%

Source: Statistical Yearbook 2000, Thua Thien Hue Province.

(2) Growth Rate by Sex

	Total		Male		Female	
	Population	Annual Rate	Population	Annual Rate	Population	Annual Rate
1990	900,927	-	438,395	-	462,532	-
1991	919,481	2.06%	448,052	2.20%	471,429	1.92%
1992	937,503	1.96%	457,499	2.11%	480,004	1.82%
1993	954,839	1.85%	466,608	1.99%	488,231	1.71%
1994	971,398	1.73%	475,474	1.90%	495,924	1.58%
1995	987,278	1.63%	484,107	1.82%	503,171	1.46%
1996	1,002,725	1.56%	492,552	1.74%	510,173	1.39%
1997	1,017,916	1.51%	500,895	1.69%	517,021	1.34%
1998	1,033,268	1.51%	509,239	1.67%	524,029	1.36%
1999	1,049,460	1.57%	517,695	1.66%	531,765	1.48%
2000	1,066,162	1.59%	525,164	1.44%	540,998	1.74%
Average 1995-2000		1.55%	504,942	1.64%	521,193	1.46%

Source: Statistical Yearbook 2000, Thua Thien Hue Province.

(3) Projection based on Natural Growth Rate (fertility rate and mortality rate)

	Total		Urban		Rural	
	Population	Annual Rate	Population	Annual Rate	Population	Annual Rate
1995	993,837	2.31%	252,802	1.74%	740,921	2.49%
1996	1,009,196	2.22%	261,569	1.76%	747,613	2.38%
1997	1,023,983	2.12%	276,746	1.69%	747,235	2.28%
1998	1,038,071	1.98%	286,269	1.62%	751,745	2.11%
1999	1,052,177	1.83%	299,052	1.56%	753,143	1.94%
2000	1,066,251	1.60%	313,427	1.40%	753,686	1.80%

Source: Estimation by the JICA Study Team.

(4) Balance between Real and Projected Population (average during the period from 1995 to 2000)

	Total		Urban		Rural	
	Population	Annual Rate	Population	Annual Rate	Population	Annual Rate
Projection (A)	1,030,700	2.01%	281,600	1.63%	749,100	2.17%
Actual (B)	1,026,100	1.55%	288,400	4.23%	737,700	0.53%
Balance A - B	-4,600	(Outflow)	6,800	(Inflow)	-11,400	(Outflow)

Source: Estimation by the JICA Study Team.

Bảng 2.4 Ước tính về dân số tại khu vực dự án

(1) Population as of 1998

City & District	Area		Population			Density	Population		Local Adm. Unit		Project Area		
	ha	sq. km	Total	Urban	Rural	per sq. km	Male	Female	Com-munes	Towns	Total	Urban	Rural
1 City Hue	6,777	68	296,019	236,336	59,683	4,170	-	-	5	20	270,827	216,223	54,604
2 Dist. Phong Dien	107,130	1,071	100,612	5,782	94,830	105	-	-	15	1	31,683	1,821	29,862
3 Dist. Quang Dien	15,700	157	91,102	9,686	81,416	559	-	-	10	1	66,701	7,092	59,609
4 Dist. Huong Tra	40,270	403	110,566	7,805	102,761	212	-	-	15	1	90,108	6,361	83,747
5 Dist. Phu Vang	26,320	263	168,857	-	168,857	602	-	-	21	-	128,689	-	128,689
6 Dist. Huong Thuy	49,660	497	90,314	12,677	77,637	197	-	-	11	1	75,351	10,577	64,774
7 Dist. Phu Loc	69,240	692	146,687	11,643	135,044	201	-	-	17	1	55,067	4,371	50,696
8 Dist. A Luoi	115,943	1,159	22,608	3,120	19,488	18	-	-	20	1	0	-	-
9 Dist. Nam Dong	69,880	699	34,731	4,859	29,872	53	-	-	10	1	0	-	-
Total	500,920	5,009	1,061,496	291,908	769,588	210	210	0	124	27	718,426	246,445	471,981

Source: Interim Report of Feasibility Study, December 1999.

(2) Population as of 2000

City & District	Area		Population			Density	Population		Local Adm. Unit		Project Area		
	ha	sq. km	Total	Urban	Rural	per sq. km	Male	Female	Com-munes	Towns	Total	Urban	Rural
1 City Hue	7,099	71	298,208	242,146	56,062	4,201	146,308	151,900	5	20	272,800	221,500	51,300
2 Dist. Phong Dien	95,375	954	100,969	6,062	94,907	106	48,893	52,076	15	1	31,800	1,900	29,900
3 Dist. Quang Dien	16,307	163	91,037	10,005	81,032	558	44,540	46,076	10	1	66,600	7,300	59,300
4 Dist. Huong Tra	52,089	521	111,480	7,644	103,836	214	55,758	55,722	15	1	90,800	6,200	84,600
5 Dist. Phu Vang	28,032	280	173,311	19,133	154,178	618	86,008	87,303	19	1	142,600	25,100	117,500
6 Dist. Huong Thuy	45,734	457	89,410	11,982	77,428	196	43,593	45,817	11	1	74,600	10,000	64,600
7 Dist. Phu Loc	72,809	728	145,286	10,830	134,456	200	71,810	73,476	17	1	54,600	4,100	50,500
8 Dist. A Luoi	122,902	1,229	35,402	5,128	30,274	29	17,639	17,763	20	1	0	-	-
9 Dist. Nam Dong	65,052	651	21,059	3,274	17,785	32	10,615	10,444	10	1	0	-	-
Total	505,399	5,054	1,066,162	316,204	749,958	211	525,164	540,577	122	28	733,800	276,100	457,700

Source: Estimation by the JICA Study Team.

Bảng 2.5 Lực lượng lao động

(unit: persons)

	1999						2000					
	Total		Male		Female		Total		Male		Female	
Total Population	1,049,460	100%	517,695	100%	531,765	100%	1,066,162	100%	525,164	100%	540,998	100%
Workable Population												
1. Persons at Working Age												
1.1 Total	556,160	53.0%	274,777	53.1%	281,383	52.9%	561,192	52.6%	277,263	52.8%	283,929	52.5%
1.2 Workable	540,040	51.5%	268,006	51.8%	272,034	51.2%	544,926	51.1%	270,431	51.5%	274,495	50.7%
1.3 Disable	16,120	1.5%	6,771	1.3%	9,349	1.8%	16,266	1.5%	6,832	1.3%	9,434	1.7%
2. Employees under & over Working Age												
2.1 Total	28,129	2.7%	16,481	3.2%	11,648	2.2%	28,129	2.6%	16,481	3.1%	11,648	2.2%
2.2 Over Working Age	22,051	2.1%	13,686	2.6%	8,365	1.6%	22,051	2.1%	13,686	2.6%	8,365	1.5%
2.3 Under Working Age	6,078	0.6%	2,795	0.5%	3,283	0.6%	6,078	0.6%	2,795	0.5%	3,283	0.6%
3. Total (1.1 + 2.1)	568,169	54.1%	284,487	55.0%	283,682	53.3%	573,055	53.7%	286,912	54.6%	286,143	52.9%
Distribution												
1. Employees in Economic Activities	425,470	40.5%	229,992	44.4%	195,478	36.8%	429,899	40.3%	232,387	44.3%	197,512	36.5%
2. Workable Persons attending Schools												
2.1 Total	72,233	6.9%	41,101	7.9%	31,132	5.9%	72,985	6.8%	41,529	7.9%	31,456	5.8%
2.2 Grade School	11,250	1.1%	5,490	1.1%	5,760	1.1%	11,367	1.1%	5,548	1.1%	5,819	1.1%
2.3 Professional & Technical Training	60,983	5.8%	35,611	6.9%	25,372	4.8%	61,618	5.8%	35,981	6.9%	25,637	4.7%
3. Workable Persons as Housewife	46,436	4.4%	991	0.2%	45,445	8.5%	46,919	4.4%	1,002	0.2%	45,917	8.5%
4. Workable Person Economically Inactive	4,662	0.4%	3,328	0.6%	1,334	0.3%	4,710	0.4%	3,369	0.6%	1,341	0.2%
5. Unemployment	18,350	1.7%	8,478	1.6%	9,872	1.9%	18,542	1.7%	8,559	1.6%	9,983	1.8%
	567,151	54.0%	283,890	54.8%	283,261	53.3%	573,055	53.7%	286,846	54.6%	286,209	52.9%

Source: Statistical Yearbook 2000, Thua Thien Hue Province.

Bảng 2.6 Tình trạng nhân khẩu của khu vực nông nghiệp

(unit: persons)

	Entire Province					Urban Area					Rural				
	1996	1997	1998	1999	2000	1996	1997	1998	1999	2000	1996	1997	1998	1999	2000
Household															
Total	125,216	126,346	129,011	128,929	124,458	6,507	6,586	6,666	6,949	6,265	118,709	119,760	122,345	121,980	118,193
Agriculture	111,336	112,195	114,555	114,265	108,760	6,021	6,089	6,154	6,426	5,701	105,315	106,106	108,401	107,839	103,059
Forestry	560	530	537	703	851	66	64	64	112	134	494	466	473	591	717
Fishery	13,320	13,621	13,919	13,961	14,847	420	433	448	411	430	12,900	13,188	13,471	13,550	14,417
Population															
Total	655,512	662,412	675,049	662,247	653,590	32,490	34,164	33,396	36,171	33,700	623,022	628,248	641,653	626,076	619,890
Agriculture	578,034	583,406	595,649	579,909	566,400	29,804	30,115	30,564	33,295	30,622	548,230	553,291	565,085	546,614	535,778
Forestry	2,940	2,783	2,843	3,603	4,286	371	360	368	569	650	2,569	2,423	2,475	3,034	3,636
Fishery	74,538	76,223	76,557	78,735	82,904	2,315	3,689	2,464	2,307	2,428	72,223	72,534	74,093	76,428	80,476
Family Size															
Total	5.24	5.24	5.23	5.14	5.25	4.99	5.19	5.01	5.21	5.38	5.25	5.25	5.24	5.13	5.24
Agriculture	5.19	5.20	5.20	5.08	5.21	4.95	4.95	4.97	5.18	5.37	5.21	5.21	5.21	5.07	5.20
Forestry	5.25	5.25	5.29	5.13	5.04	5.62	5.63	5.75	5.08	4.85	5.20	5.20	5.23	5.13	5.07
Fishery	5.60	5.60	5.50	5.64	5.58	5.51	8.52	5.50	5.61	5.65	5.60	5.50	5.50	5.64	5.58
Labor Force															
Total	334,242	338,152	344,432	331,095	346,336	16,417	15,482	15,882	14,139	16,571	317,825	320,774	327,289	315,777	328,478
Agriculture	295,103	297,481	303,934	289,683	300,134	15,047	15,298	15,694	13,877	16,226	280,056	282,183	288,240	275,806	283,908
Forestry	1,486	1,420	1,450	1,788	2,271	189	184	188	262	345	1,297	1,236	1,262	1,526	1,926
Fishery	37,653	39,251	39,048	39,624	43,931	1,181	1,896	1,261	1,179	1,287	36,472	37,355	37,787	38,445	42,644
Labor per Household															
Total	2.67	2.68	2.67	2.57	2.78	2.52	2.35	2.38	2.03	2.65	2.68	2.68	2.68	2.59	2.78
Agriculture	2.65	2.65	2.65	2.54	2.76	2.50	2.51	2.55	2.16	2.85	2.66	2.66	2.66	2.56	2.75
Forestry	2.65	2.68	2.70	2.54	2.67	2.86	2.88	2.94	2.34	2.57	2.63	2.65	2.67	2.58	2.69
Fishery	2.83	2.88	2.81	2.84	2.96	2.81	4.38	2.81	2.87	2.99	2.83	2.83	2.81	2.84	2.96
No. of Cooperatives															
	169	169	172	172	157	-	-	-	-	-	-	-	-	-	-

Source: Statistical Yearbook 2000, Thua Thien Hue Province.

Bảng 2.7 Hiện trạng sử dụng đất của tỉnh Thừa Thiên Huế

(unit: ha)

Land Use Items	1997		1998		2000	
Total Area	500,900	100.0%	500,900	100.0%	505,400	100.0%
1. Agricultural Land	55,200	11.0%	56,300	11.2%	61,200	12.1% *1
Annual Crop Field	40,200	8.0%	41,600	8.3%	46,200	9.1% *2
<u>Paddy Field</u>	<u>30,000</u>	6.0%	<u>29,800</u>	5.9%	<u>27,400</u>	5.4%
<u>Other cereals and industrial crop</u>	<u>7,500</u>	1.5%	<u>9,600</u>	1.9%	-	
<u>Vegetables</u>	<u>200</u>	0.0%	<u>100</u>	0.0%	-	
<u>Burnt-over land</u>	<u>2,100</u>	0.4%	<u>1,800</u>	0.4%	-	
<u>Others</u>	<u>400</u>	0.1%	<u>300</u>	0.1%	-	
Perenial Crop Field	2,800	0.6%	3,700	0.7%	3,800	0.8% *2
<u>Industrial Crops</u>	<u>2,200</u>	0.4%	<u>3,100</u>	0.6%	-	
<u>Fruits</u>	<u>100</u>	0.0%	<u>500</u>	0.1%	-	
<u>Other</u>	<u>500</u>	0.1%	<u>100</u>	0.0%	-	
Grazing Land	2,800	0.6%	1,600	0.3%	1,600	0.3% *2
Water Surface	1,400	0.3%	1,700	0.3%	1,700	0.3% *2
Garden	8,000	1.6%	7,700	1.6%	7,900	1.6% *2
2. Forest Lan	197,200	39.4%	199,300	39.8%	214,800	42.5%
Natural Foret	154,800	30.9%	154,500	30.9%	-	
Plantted Forest	42,400	8.5%	44,800	8.9%	-	
3. Specially Used Land	19,900	4.0%	20,900	4.2%	20,900	4.1%
Construction Land	2,000	0.4%	2,000	0.4%	-	
Transportaiton Land	3,600	0.7%	3,900	0.8%	-	
Irrigation Land	5,000	1.0%	4,400	0.9%	-	
Others	9,300	1.9%	10,600	2.1%	-	
4. Residential Land	4,400	0.9%	4,200	0.8%	4,300	0.9%
5. Unused Land	224,200	44.8%	220,200	44.0%	204,200	40.4%
Flat Land	19,100	3.8%	18,400	3.7%	-	
Mountanous land	166,200	33.2%	161,800	32.3%	-	
Water Surface	21,400	4.3%	22,100	4.4%	-	
Others	17,500	3.5%	17,900	3.6%	-	

No *1: 61,200 ha including 2,300 ha of water surface.

Source 1. Statistical Yearbook 2000, Thua Thien Hue Province.

2. Interim Report, Feasibility Study on Ta Trach Project, December 1999.

Bảng 2.8 Diện tích canh tác

	(unit: ha)						
	1996	1997	1998	1999	2000	Average	
Total Cropped Area	76,700	78,100	81,200	82,600	80,600	78,900	100.0%
Annual Crop	73,700	74,200	76,900	78,400	76,100	74,900	94.9%
Food Crop	63,600	63,700	62,300	63,300	61,900	62,000	78.6%
Vegetables and Beans	4,900	5,100	4,900	5,000	5,100	5,000	6.3%
Industrial Crops	5,200	5,400	9,700	10,100	9,100	7,900	10.0%
Perennial Crop	3,000	3,900	4,300	4,200	4,500	4,000	5.1%
Industrial Crop	2,100	2,600	2,700	2,600	2,700	2,500	3.2%
Fruit Crop	900	1,300	1,600	1,600	1,700	1,500	1.9%
Others	0	0	0	0	100	0	0.0%
Total Cropped Area	76,621	77,905	81,163	82,620	80,593	78,900	100.0%
Annual Crop	73,601	74,073	76,867	78,354	76,121	74,900	94.9%
Food Crop	63,551	63,654	62,282	63,251	61,881	62,000	78.6%
Paddy	49,490	50,085	49,856	51,044	51,341	49,500	62.7%
Spring Paddy	26,194	26,270	26,206	26,378	26,504	26,300	33.3%
Autumn Paddy	22,272	22,695	22,980	24,017	24,091	23,200	29.4%
Winter Paddy	1,024	1,120	670	649	746	800	1.0%
Maize	823	901	932	868	1,160	900	1.1%
Sweet Potatoes	7,683	7,447	6,856	6,626	5,090	6,700	8.5%
Cassava	5,555	5,221	4,638	4,713	4,290	4,900	6.2%
Vegetables and Beans	4,883	5,062	4,899	5,013	5,130	5,000	6.3%
Industrial Crops	5,167	5,357	9,686	10,090	9,110	7,900	10.0%
Rush	15	5	6	6		0	0.0%
Sugarcane	307	502	4,336	5,085	4,250	2,900	3.7%
Groundnuts	3,729	3,781	4,258	4,093	3,910	4,000	5.1%
Tabacco	208	167	122	116	110	100	0.1%
Sesame	352	409	420	430	500	400	0.5%
Other crops	556	493	544	360	340	500	0.6%
Perennial Crop	3,020	3,832	4,296	4,266	4,472	4,000	5.1%
Industrial Crop	2,086	2,551	2,668	2,611	2,657	2,500	3.2%
Tea	350	340	303	320	329	300	0.4%
Coffee	26	70	240	156	40	100	0.1%
Rubber	1,643	2,056	2,020	2,020	2,171	2,000	2.5%
Pepper	67	85	105	115	117	100	0.1%
Fruit Crop	925	1,266	1,585	1,609	1,745	1,500	1.9%
Pinnacle	162	350	507	527	612	400	0.5%
Banana	369	410	440	448	270	400	0.5%
Citrus	128	220	348	336	370	300	0.4%
Mango	14	13	13	13	13	0	0.0%
Coconut	178	170	143	145	130	200	0.3%
Others	74	103	134	140	350	200	0.3%
Others	9	15	43	46	70	0	0.0%

Source: Statistical Yearbook 2000, Hue Province.

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Bảng 2.9 Diện tích, năng suất và sản lượng lúa

(unit: ha for area, ton/ha for yield, ton for production)

Crop City & District	1996			1997			1998			1999			2000			2000		
	Area	Yield	Produc.	Area	Yield	Produc.	Area	Yield	Produc.	Area	Yield	Produc.	Area	Yield	Produc.	Area	Yield	Produc.
Spring Paddy	26,194	3.96	103,668	26,270	4.10	107,710	26,206	3.89	102,048	26,378	4.23	111,587	26,504	4.22	111,846	26,504	4.05	107,372
Autum Paddy	22,272	3.70	82,309	22,695	3.87	87,860	22,980	3.71	85,178	24,017	4.33	104,109	24,091	3.49	84,014	23,215	3.82	88,696
Winter Paddy	1,024	0.94	963	1,120	0.90	1,010	670	0.80	536	649	0.43	280	746	1.00	746	888	0.84	748
Total	49,490	3.78	186,940	50,085	3.92	196,580	49,856	3.77	187,762	51,044	4.23	215,976	51,341	3.83	196,606	50,607	3.89	196,816
Spring Paddy	26,194	3.96	103,668	26,270	4.10	107,710	26,206	3.89	102,048	26,378	4.23	111,587	26,504	4.22	111,846	26,504	4.05	107,372
1 Hue City	1,137	5.15	5,860	1,130	4.66	5,271	1,120	4.61	5,163	1,082	5.15	5,573	1,080	4.92	5,314	1,110	4.90	5,436
2 Hong Dien	4,050	3.63	14,700	4,181	3.84	16,062	4,200	3.60	15,136	4,200	3.81	15,984	4,310	4.00	17,260	4,188	3.78	15,828
3 Quang Dien	4,240	4.50	19,089	4,204	4.72	19,850	4,049	4.30	17,418	4,092	4.65	19,042	4,120	4.55	18,745	4,141	4.55	18,829
4 Huong Tra	3,051	4.45	13,570	3,073	4.67	14,354	3,050	4.21	12,826	3,130	4.70	14,711	3,130	4.67	14,624	3,087	4.54	14,017
5 Phu Vang	5,612	3.37	18,900	5,720	3.61	20,649	5,794	3.50	20,287	5,828	3.75	21,855	5,840	3.70	21,592	5,759	3.59	20,657
6 Huong Thuy	3,357	4.98	16,720	3,347	4.74	15,865	3,342	4.67	15,598	3,376	5.15	17,387	3,350	5.13	17,189	3,354	4.94	16,552
7 Phu Loc	3,857	3.13	12,090	3,881	3.39	13,161	3,879	3.40	13,170	3,887	3.70	14,382	3,830	3.68	14,102	3,867	3.46	13,381
8 Nam Dong	301	3.12	939	204	3.82	779	224	3.90	873	238	4.05	963	280	4.41	1,236	249	3.85	958
9 A Luoi	589	3.06	1,800	530	3.24	1,719	548	2.88	1,577	545	3.10	1,690	520	3.43	1,784	546	3.14	1,714
Autum Paddy	22,272	3.70	82,309	22,695	3.87	87,860	22,980	3.71	85,178	24,017	4.33	104,109	24,091	3.49	84,014	23,215	3.82	88,696
1 Hue City	1,160	3.45	4,002	1,167	4.33	5,055	1,150	4.42	5,083	1,161	4.92	5,707	1,180	3.53	4,166	1,164	4.13	4,803
2 Hong Dien	3,886	3.32	12,902	4,014	3.42	13,744	4,015	2.93	11,757	4,107	4.21	17,299	4,140	3.08	12,741	4,032	3.40	13,689
3 Quang Dien	3,801	3.90	14,805	3,806	4.20	16,001	3,757	4.48	16,822	3,840	4.68	17,963	3,866	3.19	12,332	3,814	4.09	15,585
4 Huong Tra	2,870	4.02	11,533	2,882	4.12	11,878	2,850	4.07	11,588	2,968	4.68	13,890	2,976	3.21	9,545	2,909	4.02	11,687
5 Phu Vang	3,361	3.63	12,217	3,595	3.71	13,337	3,785	3.20	12,120	4,308	4.07	17,533	4,354	3.78	16,442	3,881	3.69	14,330
6 Huong Thuy	3,024	4.50	13,617	3,039	4.65	14,132	3,076	4.50	13,838	3,151	5.11	16,089	3,181	4.25	13,518	3,094	4.60	14,239
7 Phu Loc	3,442	3.25	11,175	3,374	3.45	11,639	3,526	3.35	11,802	3,560	3.62	12,900	3,504	3.58	12,542	3,481	3.45	12,012
8 Nam Dong	197	3.00	591	307	2.03	623	291	2.53	737	375	2.66	998	368	2.73	1,005	308	2.57	791
9 A Luoi	551	2.66	1,467	511	2.84	1,451	530	2.70	1,431	547	3.16	1,730	522	3.30	1,723	532	2.93	1,560
Winter Paddy	1,024	0.94	963	1,120	0.90	1,010	670	0.80	536	649	0.43	280	746	1.00	746	888	0.84	748
1 Hue City	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2 Hong Dien	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 Quang Dien	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4 Huong Tra	30	1.00	30	30	1.00	30	37	1.19	44	-	-	-	-	-	-	32	1.09	35
5 Phu Vang	100	0.61	61	120	0.90	108	36	0.89	32	-	-	-	-	-	-	85	0.79	67
6 Huong Thuy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7 Phu Loc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8 Nam Dong	226	0.67	152	203	0.75	152	167	0.78	130	174	0.69	120	119	1.00	119	178	0.76	135
9 A Luoi	668	1.08	720	767	0.94	720	430	0.77	330	475	0.34	160	627	1.00	627	593	0.86	511

Source: Statistical Yearbook 2000, Thua Thien Hue Province.

Bảng 2.10 Diện tích, năng suất và sản lượng hoa màu khác

(unit: ha for area, ton/ha for yield, ton for production)

Crop	1996			1997			1998			1999			2000			Average 1998 - 2000		
	Area ha	Yield ton/ha	Produc. ton	Area ha	Yield ton/ha	Produc. ton	Area ha	Yield ton/ha	Produc. ton	Area ha	Yield ton/ha	Produc. ton	Area ha	Yield ton/ha	Produc. ton	Area ha	Yield ton/ha	Produc. ton
Maize	823	1.84	1,513	901	1.96	1,763	932	1.86	1,738	868	1.57	1,365	1,164	2.29	2,671	938	1.93	1,810
Sweet Potato	6,982	4.81	33,573	6,679	4.82	32,210	6,218	4.64	28,857	5,972	3.65	21,804	4,448	4.61	20,522	6,060	4.52	27,393
Cassava	5,555	6.47	35,930	5,221	7.11	37,103	4,638	7.00	32,466	4,713	3.45	16,269	4,297	6.49	27,881	4,885	6.13	29,930
Potatoes	701	6.49	4,550	768	6.60	5,069	638	6.29	4,015	654	6.35	4,155	647	6.05	3,914	682	6.37	4,341
Vegetables	2,326	9.95	23,150	2,354	10.98	25,849	2,435	10.50	25,577	2,589	10.59	27,422	3,122	9.76	30,469	2,565	10.33	26,493
Beans	2,141	0.51	1,087	2,273	0.61	1,389	2,112	0.51	1,075	2,033	0.45	924	1,973	0.45	879	2,106	0.51	1,071
Hot Peppwe	416	0.69	285	425	0.74	313	362	0.70	255	391	0.72	281	371	0.76	282	393	0.72	283
Groundnut	3,729	1.38	5,153	3,781	1.51	5,727	4,258	1.36	5,790	4,093	1.41	5,783	3,919	1.39	5,452	3,956	1.41	5,581
Sesame	352	0.27	96	409	0.33	135	420	0.30	126	430	0.31	133	508	0.28	144	424	0.30	127
Sugarcane	307	30.5	9,375	502	31.5	15,813	4,336	12.1	52,600	5,085	17.8	90,554	4,259	18.7	79,567	2,898	17.1	49,582
Tobacco	208	0.88	183	167	0.93	155	122	0.85	104	116	0.85	99	115	0.85	98	146	0.88	128
Total	23,540	4.88	114,895	23,480	5.35	125,526	26,471	5.76	152,603	26,944	6.26	168,789	24,823	6.92	171,879	25,052	5.86	146,738

Source: Statistical Yearbook 2000, Thua Thien Hue Province. Area and production are rounded.

Bảng 4.1 Yêu cầu nước tưới, sông Hương, 2001, lượng mưa trung bình năm

(using data in Hue, Present Cropping Pattern (2001))

No.	Year	No.	Crop	Cropping Area (ha)	Area Ratio	Cropping Period												Total (mm/period)	Gross Requirement																									
						Jan.			Feb.			Mar.			Apr.				May			Jun.			Jul.			Aug.			Sep.			Oct.			Nov.			Dec.			Depth (mm/year)	Volume (m ³ /year/ha)
						1	2	3	1	2	3	1	2	3	1	2	3		1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3								
			Potential Evapotranspiration (ETo)	mm/month		68			68			82			116			150			176			189			163			116			96			75			61			1,360		
			Potential Evapotranspiration (ETo)	mm/10-day		22	22	24	23	23	22	27	27	28	39	39	38	50	50	50	59	59	58	63	63	63	54	54	55	39	39	38	32	32	32	25	25	25	20	20	21	1,360		
			Effective Rainfall (Pe)			39	39	40	17	17	18	13	13	14	17	17	18	24	24	26	31	31	32	28	28	28	31	31	32	57	57	57	68	68	68	61	61	60	52	52	53	1,322		
A			Winter - Spring Crops																																									
			Ave. 1. Paddy	18,000	0.69																																							
			a Land Preparation (60 mm)																																									
			Area (A%)																																									
			b Evaporation (ETo*1.1*A%)																																									
			c Percolation (2mm/day*A%)																																									
			d Total Land Preparation Req. (a+b+c)																																									
			Crop Coefficient (kc)																																									
			e Crop Water Req. (CWR)																																									
			f Percolation (2mm/day)																																									
			g Consumptive Use (CUW) (d+e+f)																																									
			h Effective Rainfall (Pe*A% or Pe)																																									
			i Net Irr. Req. (NIR)	mm/10-day		4.8	6.3	11.0	32.4	33.4	27.9	43.5	42.6	42.7	46.3	41.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	16.7	13.3	11.1	374	623	6,226			
			2. Upland Crops	7,900	0.31																																							
			Crop Coefficient (kc) (Tomato)																																									
			Crop Water Req. (CWR)																																									
			Effective rainfall (Pe)																																									
			Net Irr. Req. (NIR)	mm/10-day		0.0	0.0	0.0	6.0	7.8	5.8	15.4	12.7	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52	86	859
B			Summer - Autumn Crops																																									
			Ave. 1. Paddy	15,000	0.58																																							
			a Land Preparation (150 mm)																																									
			Area (A%)																																									
			b Evaporation (ETo*1.1*A%)																																									
			c Percolation (2mm/day*A%)																																									
			d Total Land Preparation Req. (a+b+c)																																									
			Crop Coefficient (kc)																																									
			e Crop Water Req. (CWR)																																									
			f Percolation (2mm/day)																																									
			g Consumptive Use (CUW) (d+e+f)																																									
			h Effective Rainfall (Pe*A% or Pe)																																									
			i Net Irr. Req. (NIR)	mm/10-day		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
			2. Upland Crops	3,200	0.12																																							
			Crop Coefficient (kc) (Tomato)																																									
			Crop Water Req. (CWR)																																									
			Effective rainfall (Pe)																																									
			Net Irr. Req. (NIR)	mm/10-day		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C			Rainy Season Crops																																									
			Ave. 1. Paddy	0.00																																								
			a Land Preparation (60 mm)																																									
			Area (A%)																																									
			b Evaporation (ETo*1.1*A%)																																									
			c Percolation (2mm/day*A%)																																									
			d Total Land Preparation Req. (a+b+c)																																									
			Crop Coefficient (kc)																																									
			e Crop Water Req. (CWR)																																									
			f Percolation (2mm/day)																																									
			g Consumptive Use (CUW) (d+e+f)																																									
			h Effective Rainfall (Pe*A% or Pe)																																									

Bảng 4.4 Yêu cầu nước tưới, sông Hương, 2001, 1/4 năm hạn hán

(using data in Hue) Present Cropping Pattern (2001)

No. Year No.	Crop	Cropping Area Area Ratio (ha)	Cropping Period												Gross Requirement																																		
			Jan.			Feb.			Mar.			Apr.			May			Jun.			Jul.			Aug.			Sep.			Oct.			Nov.			Dec.			Total (mm/period)	Depth (mm/year)	Volume (m ³ /year/ha)								
			1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3														
	Potential Evapotranspiration (ETo)	mm/month	68			82			116			150			176			189			163			116			96			75			61																
	Potential Evapotranspiration (ETo)	mm/10-day	22	22	24	23	23	22	27	27	28	39	39	38	50	50	50	59	59	58	63	63	63	54	54	55	39	39	38	32	32	32	25	25	25	20	20	21	1,360										
	Effective Rainfall (Pe)	mm/10-day	18	18	20	1	1	3	6	6	6	16	16	20	15	15	16	24	24	23	9	9	9	31	31	32	29	29	30	71	71	70	58	58	59	55	55	54	1,008										
A	Winter - Spring Crops	1993 1. Paddy a Land Preparation (60 mm) Area (A %) b Evaporation (ETo*1.1*A%) c Percolation (2mm/day*A%) d Total Land Preparation Req. (a+b+c) Crop Coefficient (kc) e Crop Water Req. (CWR) f Percolation (2mm/day) g Consumptive Use (CUW) (d+e+f) h Effective Rainfall (Pe*A% or Pe) i Net Irr. Req. (NIR)	18,000	0.69	1.08	1.15	1.21	1.28	1.32	1.36	1.35	1.32	1.24	1.11	0.99	0.90	23.8	25.3	29.0	29.4	30.4	29.9	36.5	35.6	34.7	43.3	38.6	0.0																					
					20.0	20.0	22.0	20.0	20.0	16.0	20.0	20.0	22.0	20.0	20.0	0.0	43.8	45.3	51.0	49.4	50.4	45.9	56.5	55.6	56.7	63.3	58.6	0.0																					
					18.0	18.0	20.0	1.0	1.0	3.0	6.0	6.0	6.0	16.0	16.0	20.0	0.0	0.0	0.0	25.8	27.3	31.0	48.4	49.4	42.9	50.5	49.6	50.7	47.3	42.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.7	11.3	10.1	503	838	8,376
					0.58	0.74	0.88	1.00	1.08	1.08	1.05	0.95	0.64	0.25																																			
					12.8	16.3	21.1	23.0	24.8	23.8	28.4	25.7	17.9	9.8																																			
					18.0	18.0	20.0	1.0	1.0	3.0	6.0	6.0	6.0	16.0																																			
					0.0	0.0	1.1	22.0	23.8	20.8	22.4	19.7	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	122	203	2,027			
					B	Summer - Autumn Crops	1993 1. Paddy a Land Preparation (150 mm) Area (A %) b Evaporation (ETo*1.1*A%) c Percolation (2mm/day*A%) d Total Land Preparation Req. (a+b+c) Crop Coefficient (kc) e Crop Water Req. (CWR) f Percolation (2mm/day) g Consumptive Use (CUW) (d+e+f) h Effective Rainfall (Pe*A% or Pe) i Net Irr. Req. (NIR)	15,000	0.58													50.0	50.0	50.0																									
																									33	67																							
																									18.2	36.9																							
																				6.6	13.4																												
																				74.8	100.3	50.0																											
																				1.05	1.11	1.20	1.30	1.34	1.35	1.31	1.20	1.02	0.90																				
																				52.5	65.5	70.8	75.4	84.4	85.1	82.5	64.8	55.1	0.0																				
																				22.0	20.0	20.0	20.0	20.0	22.0	20.0	0.0	0.0																					
																				74.8	100.3	124.5	85.5	90.8	95.4	104.4	105.1	104.5	84.8	55.1	0.0																		
																				5.0	10.1	16.0	24.0	24.0	23.0	9.0	9.0	9.0	31.0	31.0	32.0																		
			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.8	90.2	108.5	61.5	66.8	72.4	95.4	96.1	95.5	53.8	24.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	834	1,390	13,901								
C	Rainy Season Crops	1993 2. Upland Crops Crop Coefficient (kc) (Tomato) Crop Water Req. (CWR) Effective rainfall (Pe) Net Irr. Req. (NIR)	3,200	0.12	0.35	0.45	0.58										13.3	19.0	22.5	29.0	43.7	51.9	58.0	68.0	68.0	66.2	51.3	34.6	13.8																				
																				20.0	15.0	15.0	16.0	24.0	24.0	23.0	9.0	9.0	9.0	31.0	31.0	32.0																	
																				4.0	7.5	13.0	19.7	27.9	35.0	59.0	59.0	57.2	20.3	3.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	306	510	5,103			
D	Year Round Crop	1993 1. Upland Crops Crop Coefficient (kc) (Sugar Cane) Crop Water Req. (CWR) Effective rainfall (Pe) Net Irr. Req. (NIR)	44,100	1.70																																													
	Weighted Ave. NIR	Total	17.9	19.0	21.9	40.4	41.6	36.2	41.9	40.5	38.9	32.9	29.6	0.0	40.9	53.2	64.4	38.0	42.1	46.3	62.6	62.9	62.4	33.7	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	7.9	7.0														
	Gross Irr. Req. GIR	mm/10-day	29.8	31.6	36.5	67.3	69.3	60.3	69.8	67.5	64.8	54.8	49.4	0.0	68.2	88.6	107.4	63.4	70.2	77.1	104.3	104.9	104.0	56.1	24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.2	13.1	11.6														
	Gross Irr. Req. GIR	lit/s/ha	0.35	0.37	0.38	0.78	0.80	0.87	0.81	0.78	0.68	0.63	0.57	0.00	0.79	1.03	1.13	0.73	0.81	0.89	1.21	1.21	1.09	0.65	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.15	0.12														
	Monthly Ave. Gross Irr. Req. GIR	lit/s/ha	0.37			0.81			0.40			0.99			0.81			1.17			0.30			0.00			0.00			0.00			0.16			0.480	0.480	lit/s/ha											
	Area	25,900 ha	9.6 m ³ /s			21.0 m ³ /s			19.4 m ³ /s			10.4 m ³ /s			25.6 m ³ /s			21.0 m ³ /s			30.3 m ³ /s			7.8 m ³ /s			0.0 m ³ /s			0.0 m ³ /s			4.1 m ³ /s					12.4 m ³ /s											

Bảng 4.5 Yêu cầu nước tưới, sông Hương, 2010, 1/4 năm hạn hán

using data in Hue, Future Cropping Pattern (2010)

No. Year No.	Crop	Cropping Area (ha)	Area Ratio	Cropping Period												Gross Requirement																										
				Jan.			Feb.			Mar.			Apr.			May			Jun.			Jul.			Aug.			Sep.			Oct.			Nov.			Dec.			Total (mm/period)	Depth (mm/year)	Volume (m ³ /year/ha)
				1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3						
	Potential Evapotranspiration (ETo)	mm/month		68			68			82			116			150			176			189			163			116			96			75			61			1,360		
	Potential Evapotranspiration (ETo)	mm/10-day		22	22	24	23	23	22	27	27	28	39	39	38	50	50	50	59	59	58	63	63	63	54	54	55	39	39	38	32	32	32	25	25	25	20	20	21	1,360		
	Effective Rainfall (Pe)	mm/10-day		18	18	20	1	1	3	6	6	6	16	16	20	15	15	16	24	24	23	9	9	9	31	31	32	29	29	30	71	71	70	58	58	59	55	55	54	1,008		
A	Winter - Spring Crops																																									
1993	1. Paddy		18,400	0.71																																						
	a Land Preparation (60 mm)																																									
	Area (A %)																																									
	b Evaporation (ETo*1.1*A%)																																									
	c Percolation (2mm/day*A%)																																									
	d Total Land Preparation Req. (a+b+c)																																									
	Crop Coefficient (kc)																																									
	e Crop Water Req. (CWR)																																									
	f Percolation (2mm/day)																																									
	g Consumptive Use (CUW) (d+e+f)																																									
	h Effective Rainfall (Pe*A% or Pe)																																									
	i Net Irr. Req. (NIR)	mm/10-day																																								
	2. Upland Crops		7,500	0.29																																						
	Crop Coefficient (kc) (Tomato)																																									
	Crop Water Req. (CWR)																																									
	Effective rainfall (Pe)																																									
	Net Irr. Req. (NIR)	mm/10-day																																								
B	Summer - Autumn Crops																																									
1993	1. Paddy		15,900	0.61																																						
	a Land Preparation (150 mm)																																									
	Area (A %)																																									
	b Evaporation (ETo*1.1*A%)																																									
	c Percolation (2mm/day*A%)																																									
	d Total Land Preparation Req. (a+b+c)																																									
	Crop Coefficient (kc)																																									
	e Crop Water Req. (CWR)																																									
	f Percolation (2mm/day)																																									
	g Consumptive Use (CUW) (d+e+f)																																									
	h Effective Rainfall (Pe*A% or Pe)																																									
	i Net Irr. Req. (NIR)	mm/10-day																																								
	2. Upland Crops		3,500	0.14																																						
	Crop Coefficient (kc) (Tomato)																																									
	Crop Water Req. (CWR)																																									
	Effective rainfall (Pe)																																									
	Net Irr. Req. (NIR)	mm/10-day																																								
C	Rainy Season Crops																																									
1993	1. Paddy			0.00																																						
	a Land Preparation (60 mm)																																									
	Area (A %)																																									
	b Evaporation (ETo*1.1*A%)																																									
	c Percolation (2mm/day*A%)																																									
	d Total Land Preparation Req. (a+b+c)																																									
	Crop Coefficient (kc)																																									
	e Crop Water Req. (CWR)																																									
	f Percolation (2mm/day)																																									
	g Consumptive Use (CUW) (d+e+f)																																									
	h Effective Rainfall (Pe*A% or Pe)																																									
	i Net Irr. Req. (NIR)	mm/10-day																																								

Bảng 6.1 Dòng chảy tự nhiên trong lưu vực sông Hương (3.300 km²)

Year	(million m ³)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	total
1976													0
1977	37	69	140	32	34	16	13	41	378	1,335	1,020	481	3,597
1978	406	95	70	47	117	81	69	44	1,343	954	1,187	942	5,357
1979	247	121	67	49	123	810	268	249	836	661	1,232	445	5,107
1980	174	85	57	50	73	135	88	68	1,996	2,437	2,560	963	8,686
1981	520	191	123	146	225	151	118	68	296	3,047	2,592	1,407	8,882
1982	463	193	126	114	84	80	62	57	640	433	1,226	417	3,895
1983	273	90	58	38	29	422	197	131	106	2,880	2,160	620	7,002
1984	287	178	102	84	146	237	420	292	295	1,607	2,305	955	6,909
1985	329	164	124	102	115	189	111	65	367	1,835	2,330	1,543	7,275
1986	451	223	176	103	207	106	75	110	413	2,199	1,152	1,119	6,335
1987	284	141	114	70	71	62	39	184	640	406	1,614	636	4,260
1988	225	131	76	46	68	43	35	42	290	1,961	1,292	824	5,032
1989	522	159	115	79	558	298	243	181	154	544	624	329	3,807
1990	176	83	55	43	111	54	62	184	771	3,122	2,502	855	8,016
1991	396	288	169	302	173	103	73	88	86	1,586	635	798	4,696
1992	401	126	77	48	65	195	128	139	312	3,024	1,314	824	6,653
1993	284	132	91	62	86	59	52	44	101	1,846	1,293	1,551	5,600
1994	441	188	127	108	121	116	68	47	589	779	965	1,596	5,145
1995	354	234	113	77	69	64	56	65	576	3,209	2,470	1,341	8,627
1996	425	357	156	125	219	213	137	80	1,496	2,676	3,057	1,875	10,815
1997	745	315	189	231	154	106	81	70	882	1,490	910	1,182	6,355
1998	245	123	80	74	192	91	86	86	1,144	897	3,433	1,913	8,363
1999	1,057	437	424	274	327	198	114	93	147	1,129	4,176	2,792	11,166
2000	1,032	406	226	246	215	212	165	532	501	2,647	2,053	1,730	9,967
Ave	407	189	127	106	149	168	115	123	598	1,779	1,838	1,131	6,731

**Bảng 6.2 Yêu cầu nước tưới trong lưu vực sông Hương
(Tổng yêu cầu nước tưới hàng tháng; m³/sec/ha)**

Present Cropping Pattern (2001)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	0.000091	0.000489	0.000617	0.000393	0.000904	0.000710	0.001124	0.000543	0.000000	0.000000	0.000000	0.000344
1977	0.000418	0.000181	0.000216	0.000563	0.001042	0.000940	0.001154	0.000316	0.000000	0.000000	0.000000	0.000229
1978	0.000031	0.000551	0.000623	0.000383	0.000758	0.000833	0.000941	0.000239	0.000000	0.000000	0.000000	0.000175
1979	0.000295	0.000668	0.000840	0.000527	0.000795	0.000360	0.001175	0.000203	0.000000	0.000000	0.000000	0.000364
1980	0.000515	0.000764	0.000794	0.000330	0.000954	0.000887	0.001054	0.000413	0.000000	0.000000	0.000000	0.000236
1981	0.000154	0.000841	0.000813	0.000453	0.000768	0.000773	0.000881	0.000481	0.000000	0.000000	0.000000	0.000159
1982	0.000251	0.000804	0.000830	0.000330	0.000904	0.000567	0.001246	0.000248	0.000000	0.000000	0.000000	0.000320
1983	0.000195	0.000821	0.000820	0.000563	0.001096	0.000390	0.001101	0.000300	0.000000	0.000000	0.000000	0.000398
1984	0.000344	0.000636	0.000800	0.000507	0.000795	0.000613	0.000542	0.000274	0.000000	0.000000	0.000000	0.000186
1985	0.000298	0.000827	0.000617	0.000277	0.001106	0.000500	0.001200	0.000526	0.000000	0.000000	0.000000	0.000135
1986	0.000287	0.000334	0.000581	0.000563	0.000758	0.000710	0.001184	0.000300	0.000000	0.000000	0.000000	0.000159
1987	0.000405	0.000401	0.000660	0.000383	0.000982	0.000910	0.000895	0.000300	0.000000	0.000000	0.000000	0.000335
1988	0.000444	0.000261	0.000787	0.000470	0.000840	0.000990	0.001247	0.000504	0.000000	0.000000	0.000000	0.000236
1989	0.000021	0.000654	0.000654	0.000437	0.000701	0.000810	0.000818	0.000300	0.000000	0.000000	0.000000	0.000411
1990	0.000308	0.000580	0.000691	0.000330	0.000941	0.001077	0.000818	0.000139	0.000000	0.000000	0.000000	0.000385
1991	0.000278	0.000234	0.000462	0.000133	0.000947	0.000920	0.001194	0.000232	0.000000	0.000000	0.000000	0.000205
1992	0.000131	0.000705	0.000820	0.000560	0.000796	0.000490	0.000928	0.000232	0.000000	0.000000	0.000000	0.000199
1993	0.000367	0.000813	0.000754	0.000400	0.000988	0.000810	0.001167	0.000300	0.000000	0.000000	0.000000	0.000159
1994	0.000271	0.000551	0.000528	0.000560	0.000982	0.000870	0.001240	0.000523	0.000000	0.000000	0.000000	0.000111
1995	0.000442	0.000329	0.000597	0.000550	0.000927	0.000750	0.001048	0.000345	0.000000	0.000000	0.000000	0.000175
1996	0.000528	0.000159	0.000813	0.000357	0.000846	0.001093	0.001078	0.000397	0.000000	0.000000	0.000000	0.000169
1997	0.000085	0.000366	0.000647	0.000313	0.000850	0.001057	0.001038	0.000239	0.000000	0.000000	0.000000	0.000128
1998	0.000304	0.000643	0.000754	0.000420	0.000718	0.000727	0.001081	0.000358	0.000000	0.000000	0.000000	0.000131
1999	0.000000	0.000234	0.000110	0.000250	0.000822	0.000977	0.001200	0.000510	0.000000	0.000000	0.000000	0.000058
2000	0.000000	0.000546	0.000830	0.000260	0.000883	0.000897	0.001078	0.000113	0.000000	0.000000	0.000000	0.000097

Future Cropping Pattern (2010)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	0.000091	0.000459	0.000578	0.000373	0.000884	0.000697	0.001107	0.000533	0.000000	0.000000	0.000000	0.000324
1977	0.000395	0.000171	0.000206	0.000530	0.001022	0.000920	0.001134	0.000310	0.000000	0.000000	0.000000	0.000219
1978	0.000031	0.000518	0.000584	0.000360	0.000742	0.000820	0.000928	0.000235	0.000000	0.000000	0.000000	0.000169
1979	0.000278	0.000624	0.000784	0.000497	0.000779	0.000350	0.001155	0.000197	0.000000	0.000000	0.000000	0.000341
1980	0.000481	0.000711	0.000738	0.000313	0.000931	0.000870	0.001034	0.000406	0.000000	0.000000	0.000000	0.000226
1981	0.000144	0.000785	0.000757	0.000427	0.000748	0.000757	0.000865	0.000474	0.000000	0.000000	0.000000	0.000152
1982	0.000234	0.000755	0.000773	0.000313	0.000884	0.000557	0.001226	0.000245	0.000000	0.000000	0.000000	0.000300
1983	0.000185	0.000766	0.000760	0.000530	0.001073	0.000380	0.001081	0.000294	0.000000	0.000000	0.000000	0.000375
1984	0.000324	0.000598	0.000747	0.000477	0.000779	0.000600	0.000529	0.000268	0.000000	0.000000	0.000000	0.000176
1985	0.000281	0.000774	0.000578	0.000260	0.001082	0.000490	0.001180	0.000517	0.000000	0.000000	0.000000	0.000128
1986	0.000271	0.000314	0.000545	0.000530	0.000742	0.000697	0.001164	0.000294	0.000000	0.000000	0.000000	0.000152
1987	0.000385	0.000377	0.000620	0.000360	0.000962	0.000897	0.000878	0.000294	0.000000	0.000000	0.000000	0.000315
1988	0.000421	0.000251	0.000734	0.000443	0.000823	0.000977	0.001220	0.000494	0.000000	0.000000	0.000000	0.000226
1989	0.000021	0.000610	0.000611	0.000413	0.000687	0.000800	0.000804	0.000294	0.000000	0.000000	0.000000	0.000391
1990	0.000288	0.000543	0.000647	0.000313	0.000924	0.001060	0.000804	0.000132	0.000000	0.000000	0.000000	0.000361
1991	0.000264	0.000218	0.000435	0.000127	0.000927	0.000903	0.001174	0.000229	0.000000	0.000000	0.000000	0.000189
1992	0.000128	0.000656	0.000760	0.000527	0.000776	0.000480	0.000911	0.000229	0.000000	0.000000	0.000000	0.000189
1993	0.000347	0.000760	0.000705	0.000380	0.000965	0.000800	0.001147	0.000294	0.000000	0.000000	0.000000	0.000152
1994	0.000251	0.000518	0.000495	0.000527	0.000962	0.000857	0.001217	0.000513	0.000000	0.000000	0.000000	0.000105
1995	0.000418	0.000312	0.000561	0.000520	0.000907	0.000737	0.001035	0.000335	0.000000	0.000000	0.000000	0.000169
1996	0.000494	0.000149	0.000757	0.000337	0.000826	0.001073	0.001058	0.000387	0.000000	0.000000	0.000000	0.000159
1997	0.000085	0.000346	0.000607	0.000293	0.000830	0.001037	0.001018	0.000235	0.000000	0.000000	0.000000	0.000125
1998	0.000284	0.000603	0.000705	0.000393	0.000698	0.000713	0.001061	0.000355	0.000000	0.000000	0.000000	0.000128
1999	0.000000	0.000218	0.000107	0.000233	0.000802	0.000963	0.001180	0.000504	0.000000	0.000000	0.000000	0.000055
2000	0.000000	0.000509	0.000773	0.000247	0.000863	0.000877	0.001058	0.000113	0.000000	0.000000	0.000000	0.000091

Future Cropping Pattern (2020)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1976	0.000091	0.000452	0.000568	0.000373	0.001027	0.000830	0.001340	0.000649	0.000000	0.000000	0.000000	0.000324
1977	0.000394	0.000171	0.000206	0.000530	0.001203	0.001110	0.001377	0.000368	0.000000	0.000000	0.000000	0.000219
1978	0.000031	0.000501	0.000574	0.000367	0.000865	0.000987	0.001117	0.000281	0.000000	0.000000	0.000000	0.000169
1979	0.000278	0.000604	0.000761	0.000500	0.000906	0.000407	0.001401	0.000229	0.000000	0.000000	0.000000	0.000344
1980	0.000475	0.000689	0.000718	0.000313	0.001092	0.001043	0.001250	0.000487	0.000000	0.000000	0.000000	0.000226
1981	0.000144	0.000752	0.000730	0.000433	0.000872	0.000903	0.001038	0.000574	0.000000	0.000000	0.000000	0.000152
1982	0.000238	0.000722	0.000750	0.000313	0.001027	0.000657	0.001486	0.000287	0.000000	0.000000	0.000000	0.000300
1983	0.000185	0.000736	0.000737	0.000530	0.001267	0.000443	0.001307	0.000348	0.000000	0.000000	0.000000	0.000378
1984	0.000324	0.000572	0.000724	0.000480	0.000906	0.000713	0.000629	0.000316	0.000000	0.000000	0.000000	0.000176
1985	0.000281	0.000741	0.000568	0.000260	0.001283	0.000577	0.001433	0.000624	0.000000	0.000000	0.000000	0.000128
1986	0.000271	0.000316	0.000538	0.000530	0.000865	0.000830	0.001413	0.000348	0.000000	0.000000	0.000000	0.000152
1987	0.000381	0.000377	0.000604	0.000367	0.001123	0.001077	0.001058	0.000348	0.000000	0.000000	0.000000	0.000315
1988	0.000417	0.000251	0.000711	0.000443	0.000957	0.001177	0.001486	0.000601	0.000000	0.000000	0.000000	0.000226
1989	0.000021	0.000597	0.000598	0.000413	0.000798	0.000957	0.000967	0.000348	0.000000	0.000000	0.000000	0.000391
1990	0.000288	0.000530	0.000635	0.000313	0.001072	0.001283	0.000967	0.000155	0.000000	0.000000	0.000000	0.000361
1991	0.000264	0.000221	0.000432	0.000127	0.001078	0.001090	0.001424	0.000268	0.000000	0.000000	0.000000	0.000189
1992	0.000128	0.000636	0.000737	0.000530	0.000903	0.000563	0.001101	0.000268	0.000000	0.000000	0.000000	0.000189
1993	0.000347	0.000730	0.000688	0.000380	0.001129	0.000957	0.001394	0.000348	0.000000	0.000000	0.000000	0.000152
1994	0.000258	0.000501	0.000492	0.000530	0.001123	0.001027	0.001479	0.000620	0.000000	0.000000		

