

Tables

Table 2-1 Future Land Use by Development Area of Hanoi Jurisdiction in 2020

Land Use Area	a		b		c				d		e		f		g		h		i		j	
	Agri- culture	Forest/ Green	Building		Resi- dential	Trans- port	Defence/ Security	River/ Lake	Other	Nature (a+b-g)	Total (ba)	Remarks (Planned pop.)										
			Indry.	Public									Defence/ Security	River/ Lake	Other	Nature (a+b-g)	Total (ba)					
Development	0	160	32	640	560	1,232	1,120	490	114	379	4	539	3,499	800,000								
Restricted	0%	4.6%	0.9%	18.3%	16.0%	35.2%	32.0%	14.0%	3.3%	10.8%	0.1%	15.4%	100.0%									
Development	0	910	451	560	490	1,501	1,820	1,680	556	2,155	74	3,065	8,696	700,000								
Extended	0%	10.5%	5.2%	6.4%	5.6%	17.3%	20.9%	19.3%	6.4%	24.8%	0.9%	35.2%	100.0%									
New	250	1,800	985	1,000	900	2,885	2,800	2,400	462	2,204	19	4,254	12,820	1,000,000								
Development	2.0%	14.0%	7.7%	7.8%	7.0%	22.5%	21.8%	18.7%	3.6%	17.2%	0.1%	33.2%	100.0%									
Central City	250	2,870	1,468	2,200	1,950	5,618	5,740	4,570	1,132	4,737	97	7,857	25,014	2,500,000								
TOTAL ①	1.0%	11.5%	5.9%	8.8%	7.8%	22.5%	22.9%	18.3%	4.5%	18.9%	0.4%	31.4%	100.0%									
Soc Son Urban	234	117	430	187	163	780	606	443	6	112	21	463	2,319	233,166								
Thanh Tri Urban	221	131	77	63	50	190	200	157	4	259	95	611	1,257	62,609								
Other Urban	455	248	507	249	213	969	807	600	10	371	116	1,074	3,576	295,775								
TOTAL ②	12.7%	6.9%	14.2%	7.0%	6.0%	27.1%	22.6%	16.8%	0.3%	10.4%	3.2%	30.0%	100.0%									
Sub-urban	38,303	6,737	10	425	30	465	4,420	1,360	826	7,661	2,290	52,701	62,062	0.7 - 0.8 mil.								
TOTAL ③	61.7%	10.9%	0.0%	0.7%	0.0%	0.7%	7.1%	2.2%	1.3%	12.3%	3.7%	84.9%	100.0%									
Hanoi Jurisdiction	39,008	9,855	1,985	2,874	2,193	7,052	10,967	6,530	1,968	12,769	2,503	61,632	90,652	3.5 - 3.6 mil.								
GRAND TOTAL	43.0%	10.9%	2.2%	3.2%	2.4%	7.8%	12.1%	7.2%	2.2%	14.1%	2.8%	68.0%	100.0%									
(①+②+③)																						

**Table 2-2 Future Cleanliness in terms of Solid Waste Uncollected
without Counter-measures**

	1998	2010	2020
1. Urban Districts	407 (25%)	1,689 (58%)	2,943 (71%)
2. Sub Urban Districts			
2.1 Soc Son	68 (75%)	92 (80%)	118 (84%)
2.2 Dong Anh	77 (81%)	153 (89%)	288 (94%)
2.3 Gia Lam	77 (63%)	151 (77%)	218 (83%)
2.4 Tu Liem	47 (71%)	76 (80%)	108 (85%)
2.5 Thanh Tri	62 (76%)	96 (83%)	136 (88%)
2.6 Total of Sub Urban Districts	332 (73%)	568 (82%)	868 (88%)
3. Total of Hanoi city	739 (35%)	2,257 (63%)	3,811 (74%)

Note1: "Without counter-measures" means that waste collection capacity of HPC would remain same as the current level without increases.

Note2: Figures in parenthesis are ratios of uncollected waste to generation amount without countermeasures.

**Table 2-3 Noise Pollution for the Present, 2010 and 2020
without Counter-measures**

Environmental Zones		Present	2010	2020
1, Old City Center	Morning	P	P	P
	Daytime	P		
	Nighttime	P		
2, Red River Right Bank North- West	Morning	P	P	P
	Daytime	P		
	Nighttime	P		
3, Red River Right Bank South	Morning	P	P	P
	Daytime	P		
	Nighttime	P		
4, Dong Anh urban area	Morning	U	P	P
	Daytime	P		
	Nighttime	U		
5, Gia Lam urban area	Morning	P	P	P
	Daytime	P		
	Nighttime	U		
6, Sub-urban Area	Morning	P	P	P
	Daytime	P		
	Nighttime	U		
7, Ho Tay Area	Morning	P	P	P
	Daytime	P		
	Nighttime	P		

Note: P: Polluted U: Unpolluted

**Table 2-4 Future Conditions of Nature and Amenity
without Counter-measures**

Environmental Zones	Present	2010	2020
1. Old City Center	B	C	C
2. Red River Right Bank North- West	B	B	C
3. Red River Right Bank South	B	B	C
4. Dong Anh urban area	B	B	C
5. Gia Lam urban area	B	B	C
6. Sub-urban Area	A	B	B
7. Ho Tay Area	B	C	C

Note: A: Fully satisfied, B: Partially satisfied, C: Not satisfied

Table 2-5 Future Conditions of Cultural & Historical Assets without Counter-measures

Environmental Zones	Present	2010	2020
1, Old City Center	B	C	C
2, Red River Right Bank North- West	-	-	-
3, Red River Right Bank South	-	-	-
4, Dong Anh urban area	-	-	-
5, Gia Lam urban area	-	-	-
6, Sub-urban Area	-	-	-
7, Ho Tay Area	B	C	C

Note: A: Fully satisfied, B: Partially satisfied, C: Not satisfied

Table 5-1 Definition of Target Satisfaction Levels

Sanitary Water Environment

Effective Area	Protection Level		
	less than 5-year return period	Between 5-year and 10-year return period	more than 10-year return period
Less than 50 %	0	0	1+
Between 50% and 75 %	0	1+	2+
More than 75 %	0	2+	3+

Clean Water Environment

Effective Area	Water Pollution Level		
	Polluted	Slightly-Polluted	Un-Polluted
Less than 50 %	0	0	1+
Between 50% and 75 %	0	1+	2+
More than 75 %	0	2+	3+

Clean City: Waste collection service coverage in terms of population (%)

Coverage Area	Collection Level
100	3+
Between 50 to 100	2+
Less than 50	1+

Green

Effective Area	Area of Green Park		
	Less than 10 m ² per capita	10 m ² or more than 10 m ² per capita	20 m ² or more than 20 m ² per capita
Less than 50 %	0	0	1+
Between 50% and 75 %	0	1+	2+
More than 75 %	0	2+	3+

Friendly Water

Recreation Area	Water Front		
	Polluted Water Bodies	Slightly-Polluted Water Bodies	Un-Polluted Water Bodies
without Recreation Area	0	1+	2+
with Recreation Area	1+	2+	3+

Table 5-2 Target Satisfaction Levels by Sector

Priority Project	Zone	Sanitary Water Environment	Clean Water Environment	Clean City	Green	Friendly Water
To Lich River Basin Drainage Project	1	3+	0	0	0	0
	2	1+	0	0	0	0
	3	3+	0	0	0	0
	4	0	0	0	0	0
	5	0	0	0	0	0
	6	1+	0	0	0	0
	7	3+	0	0	0	0
	8					
Waste Lake Water Quality Improvement Project	1	0	2+	0	0	0
	2	0	0	0	0	0
	3	0	0	0	0	0
	4	0	0	0	0	0
	5	0	0	0	0	0
	6	0	0	0	0	0
	7	0	3+	0	0	3+
	8					
Main City Lakes Improvement Project	1	1+	0	0	1+	1+
	2	0	0	0	0	0
	3	0	0	0	0	0
	4	0	0	0	0	0
	5	0	0	0	0	0
	6	0	0	0	0	0
	7	0	0	0	1+	1+
	8					
Public Sewerage Development for Old City Center	1	0	3+	0	0	2+
	2	0	0	0	0	0
	3	0	2+	0	0	1+
	4	0	0	0	0	0
	5	0	0	0	0	0
	6	0	0	0	0	0
	7	0	0	0	0	0
	8					
Improvement of the Primary Collection System of Solid Waste	1	0	1+	3+	0	0
	2	0	1+	3+	0	0
	3	0	1+	3+	0	0
	4	0	0	0	0	0
	5	0	0	0	0	0
	6	0	0	0	0	0
	7	0	1+	3+	0	0
	8					
Establishment of Septage Collection and Disposal System	1	0	1+	0	0	0
	2	0	1+	0	0	0
	3	0	1+	0	0	0
	4	0	1+	0	0	0
	5	0	1+	0	0	0
	6	0	0	0	0	0
	7	0	1+	0	0	0
	8					

Table 5-3 Benefits of Structural Priority Project

Priority Project	Target	Area	Number of Beneficiaries in 2020	Other Tangible Benefits
To Lich River Basin Drainage Project	<ul style="list-style-type: none"> Sanitary Water 	75.4 km ² (To Lich River)	1,085,895	<ul style="list-style-type: none"> The project will ensure the average protection level corresponding to 10 year return period storm water. Enhanced economic activities and reduction of interruption of traffic Enhancement of land value and securing the urban development
West Lake Water Quality Improvement Project	<ul style="list-style-type: none"> Clean Water Friendly Water 	39.1 km ² (EZ 1 & 7)	854,090	<ul style="list-style-type: none"> Provision of suitable waterfront on West Lake with total 520 ha water surface and 12 km shoreline Water pollution generation load of BOD 6,432 kg/day in 2010 is to be treated properly by the sewerage system to be constructed by the project, Water quality of the Lake is to be improved to Un-polluted level.
Main City Lakes Improvement Project	<ul style="list-style-type: none"> Sanitary Water Friendly Water 	39.1 km ² (EZ 1 & 7)	854,090	<ul style="list-style-type: none"> Provision of suitable waterfront on 14 lakes with total 83.7 ha water surface and 13.5 km shorelines, Activating tourist industry in Hanoi, especially in EZ 1 & 7 Sustaining the living environment and amenity for residents in EZ 1 & 7 Reduce the flood damages, Improvement of welfare and social security.
Public Sewerage Development for Old City Center	<ul style="list-style-type: none"> Clean Water Friendly Water 	28.8 km ²	712,493	<ul style="list-style-type: none"> Water pollution load of BOD 74,700 kg/day in 2010 is to be treated properly by the sewerage system of the project Improvement of water quality in urban rivers in Environmental Zone 1 & 3 by way of the above treatment is as shown below. Improvement of the living environment and health with reduction in disease contraction in EZ 1, Tourism promotion due to preparing clean water environment in Hanoi, Improvement of water resources, such as lakes and groundwater, and Securing the agriculture and fishery activities in EZ 1 and 3, Sustaining the living environment and amenity for residents EZ 1
Improvement of the Primary Collection System of Solid Waste	<ul style="list-style-type: none"> Clean City 	84.1 km ² (7 urban district)	1,433,861	<ul style="list-style-type: none"> Preparation of clean city area of 84.1 km² Improvement of water environment by way of free from uncollected garbage
Establishment of Septage Collection and Disposal System	<ul style="list-style-type: none"> Clean Water Clean City 	250.3 km ²	648,972	<ul style="list-style-type: none"> Improvement of the living environment and health condition with reduction in disease contraction, Improvement of water environmental condition of rivers, lakes and groundwater, and securing the agriculture and fishery activities,

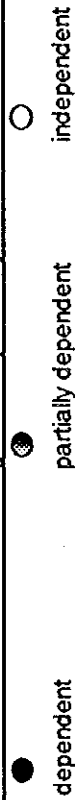
Table 5-4 Cost Effectiveness

	Investment Cost up to 2010 (US\$1,000)	Cost per Beneficiary (US\$)
1) To Lich Basin Drainage Project Stage 2	153,941	10.6
2) City Lake Conservation (14 Lakes)	10,128	0.9
3) Waste Lake Conservation	36,421	3.3
4) Public Sewarage	223,563	24.7
5) Septage	16,000	3.0
6) Waste Primary Collection	32,980	4.5
7) Nam Son Landfill/transfer System	52,040	4.2
Total	525,073	-

Table 5-5 Relationship between priority projects

Priority Project Selected for Implementation	To → From												
	Structural						Complimentary project						
	1	2	3	4	5	6	7	8	9	10	11	12	13
Structural													
1 To Lich River Basin Drainage Project	○	○	○	○	○	○	○	○	○	○	○	○	○
2 West Lake Water Quality Improvement	○	○	○	○	○	○	○	○	○	○	○	○	○
3 Main City Lakes Improvement	○	○	○	○	○	○	○	○	○	○	○	○	○
4 Public Sewerage Development	○	○	○	○	○	○	○	○	○	○	○	○	○
5 Improved Primary Collection System for Solid Waste	○	○	○	○	○	○	○	○	○	○	○	○	○
6 Septage Collection and Disposal	○	○	○	○	○	○	○	○	○	○	○	○	○
Non-structural													
7 Establish and reinforce environmental monitoring system													
8 Establish Environmental Coordination Committee													
9 Reinforce Hanoi DOSTE													
10 Strengthen Env. Management at District Level													
11 Reform HSDC													
12 Reform URENCO and other SWM organizations													
13 Establish Environmental Fund													

Degree of dependency



Complimentary Projects - Other priority projects whose implementation increases the benefits and/or likelihood of success and sustainable implementation of a given priority project.

Figures

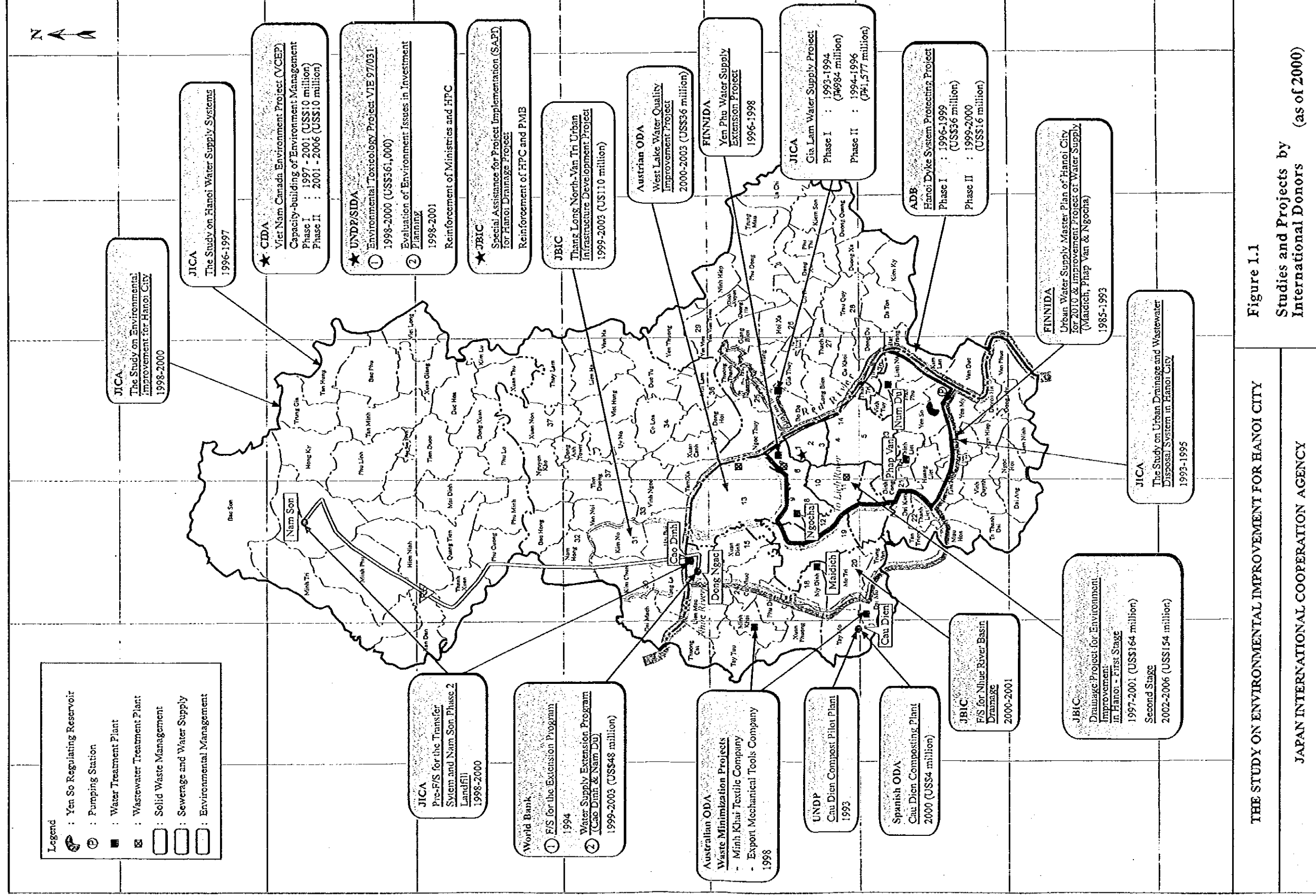
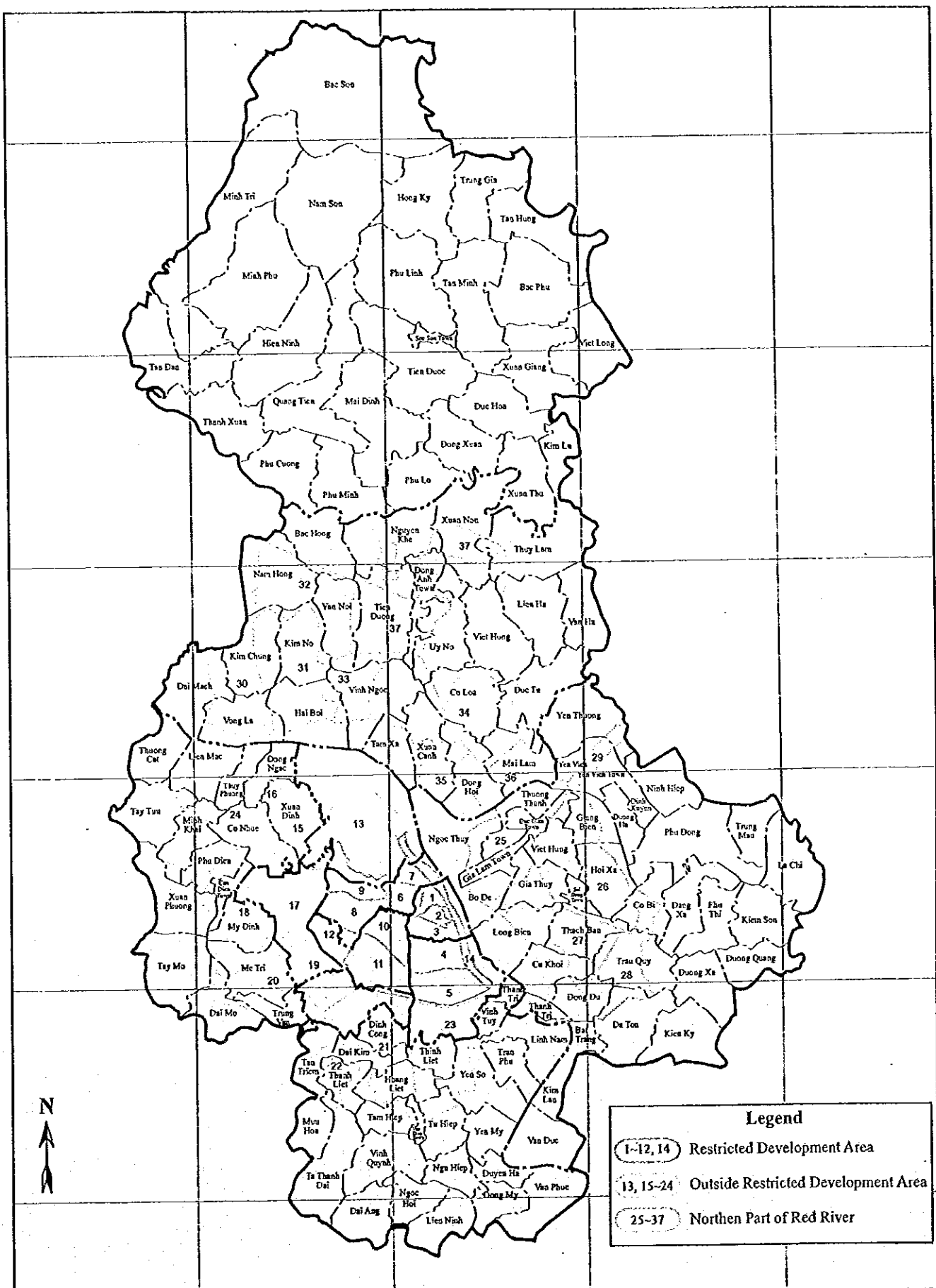


Figure 1.1
Studies and Projects by
International Donors (as of 2000)

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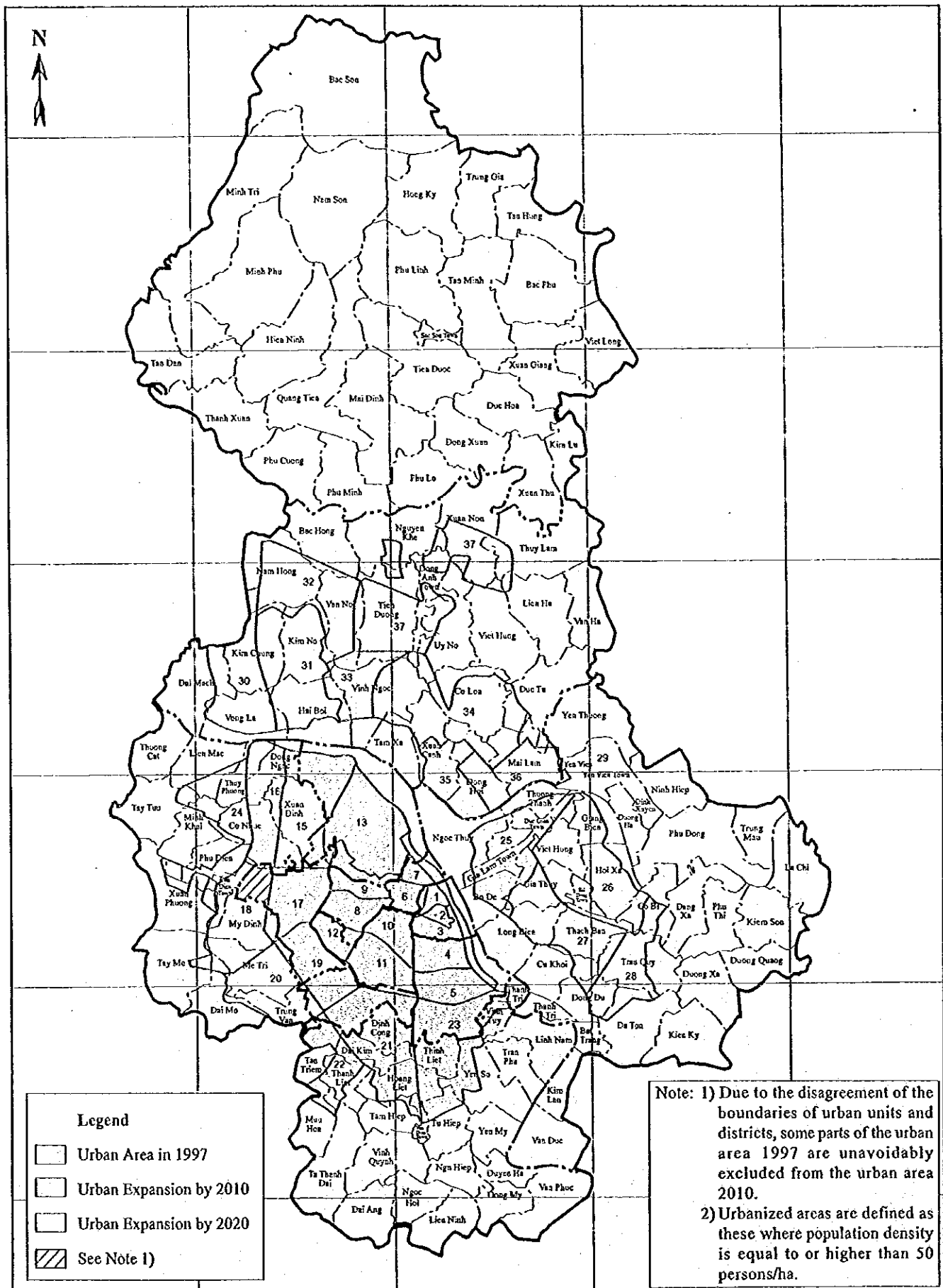


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Figure 2-1

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37 Urban Development Units for 2020

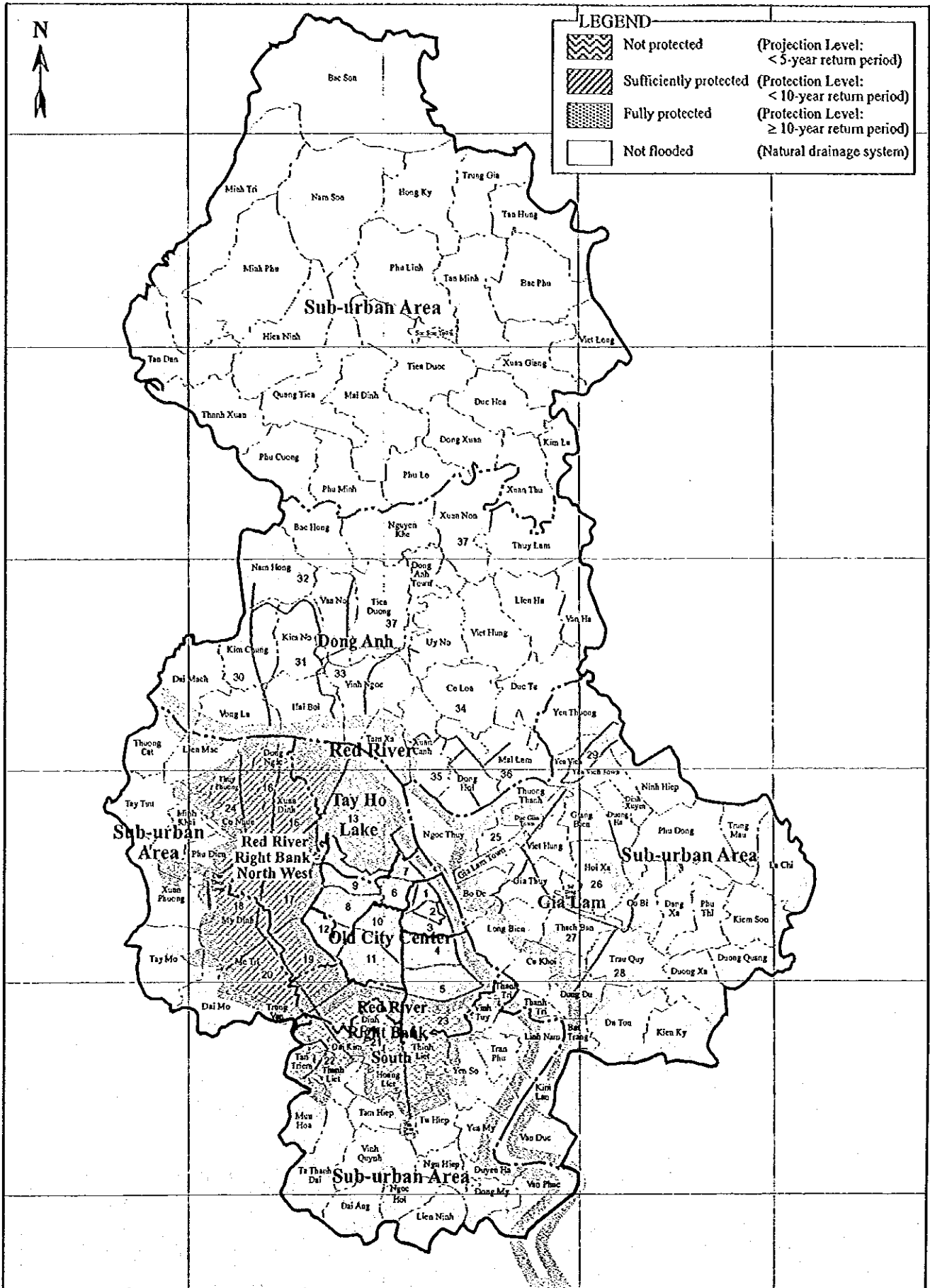


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Figure 2-2

Urban Expansion by 2020

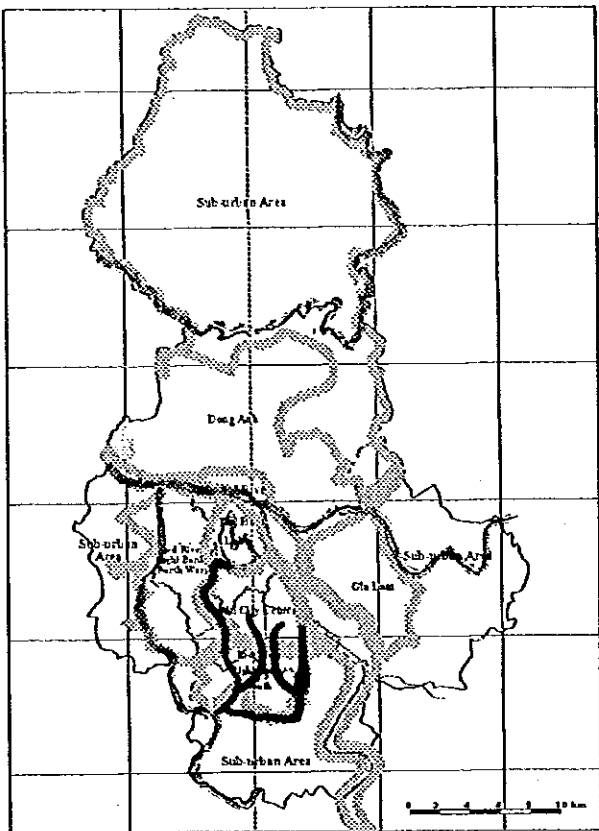
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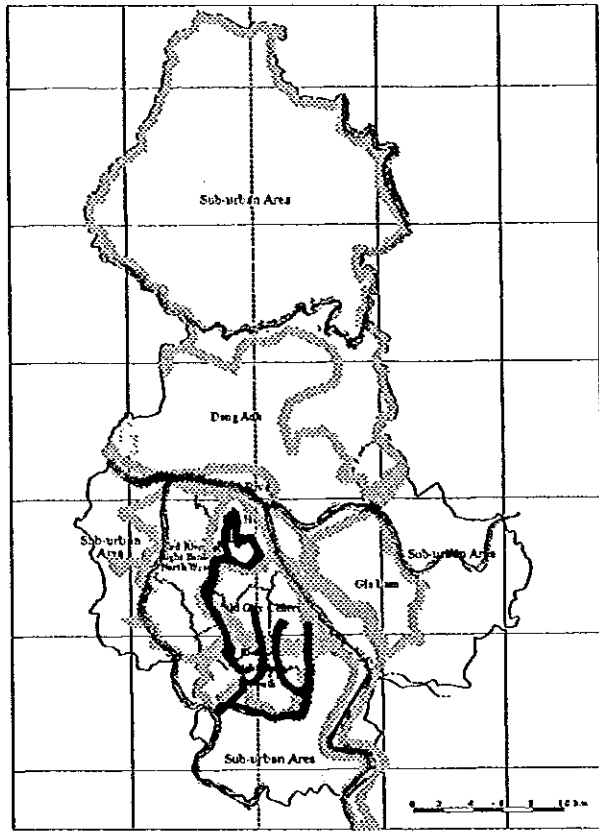
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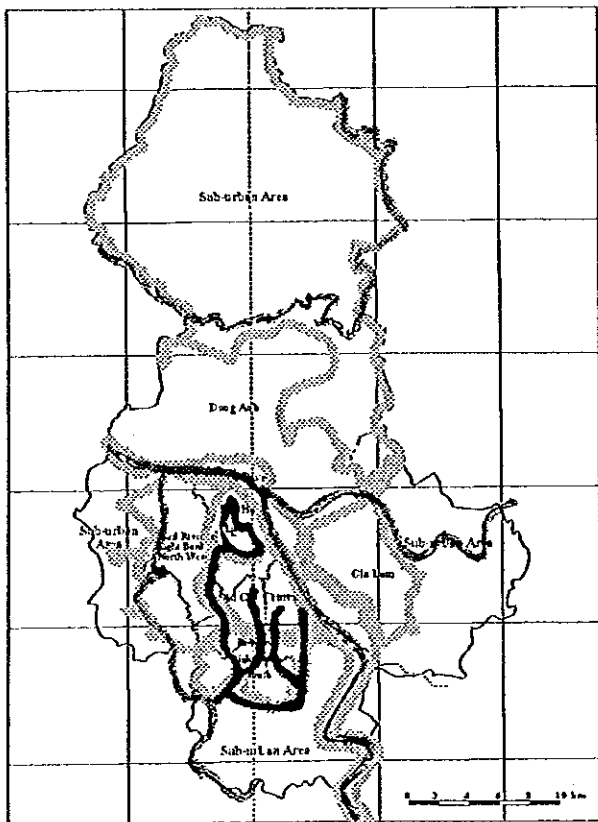
Figure 2-3
Water-related Sanitary Conditions
Without Countermeasures
(Present, 2010, 2020)



Present






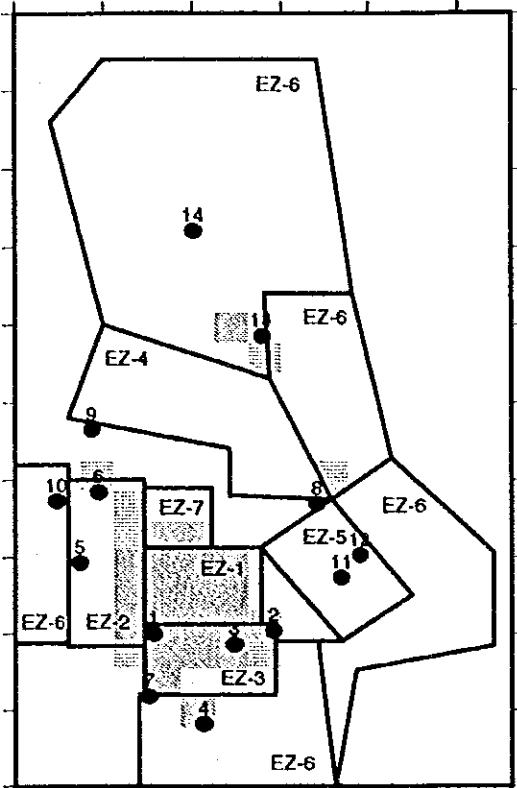
Year 2010



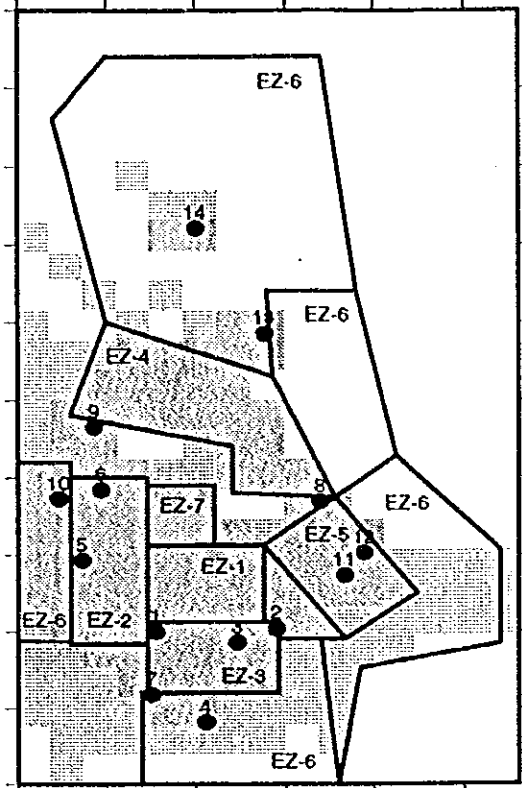
Year 2020

Legend

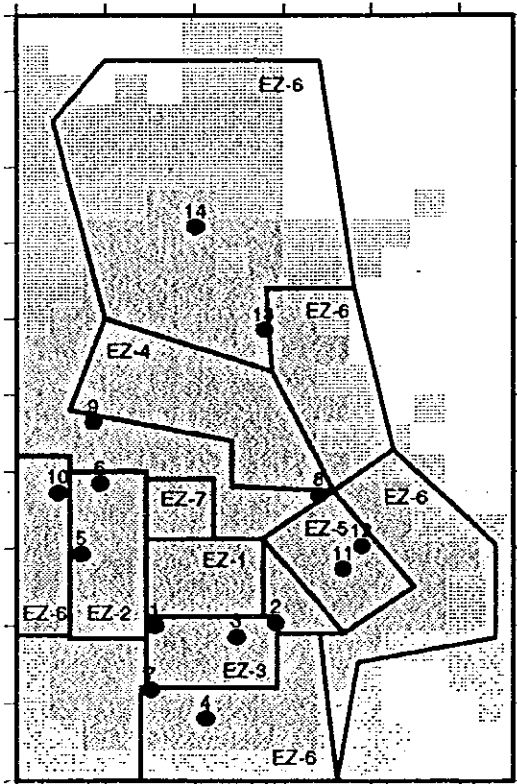
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-  Slightly Polluted
-  Un-Polluted



Present

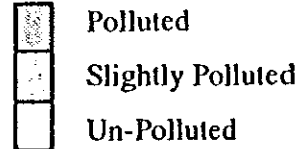


Year 2010

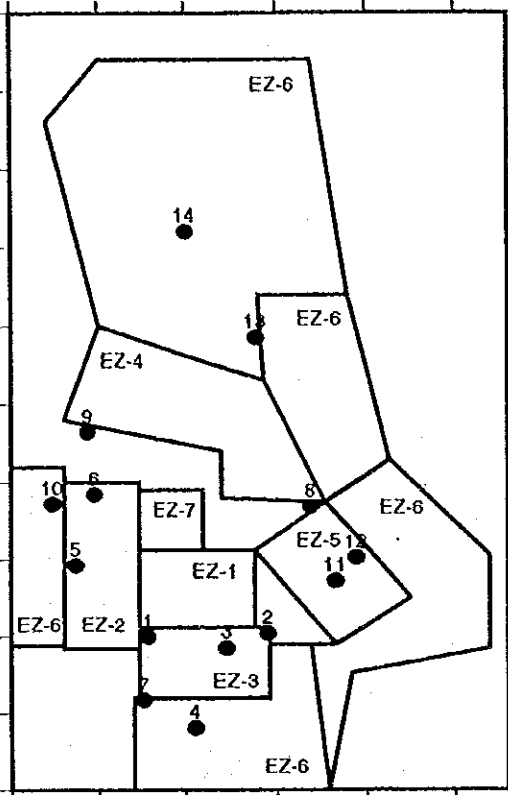


Year 2020

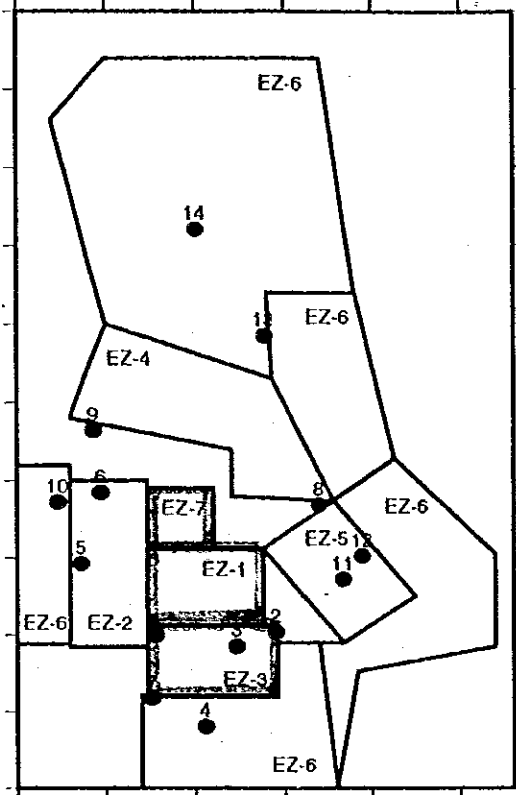
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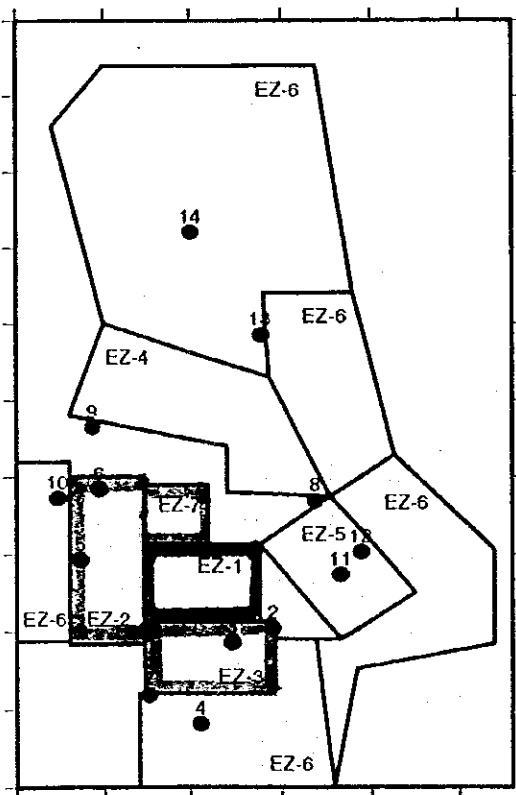
Number	Industrial Zone
1	Thuong Dinh
2	Minh Khai - Vinh Tuy
3	Trung Dinh - Hoang Mai
4	Van Dien - Phap Van
5	Cau Dien - Mai Dich
6	Chem
7	Cau Buoc
8	Duc Giang - Gia Lam - Yen Vien
9	North Thang Long
10	South Thang Long
11	Sai Dong A
12	Sai Dong B
13	Dong Anh
14	Soc Son



Present



Year 2010



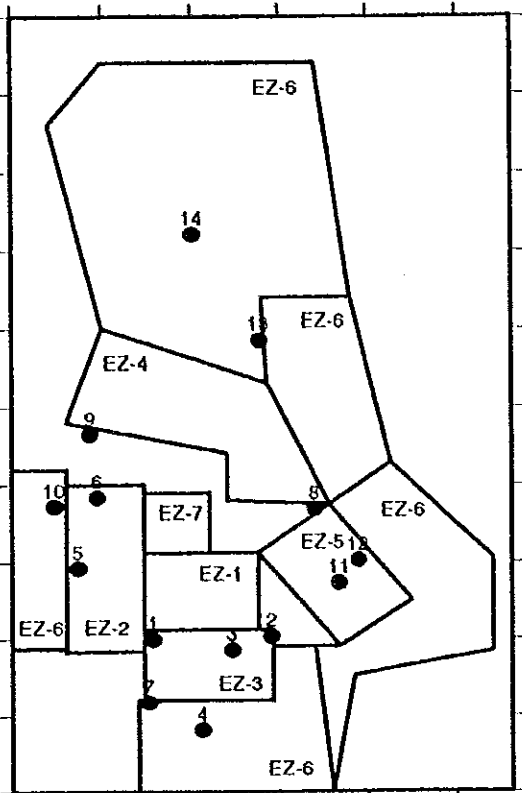
Year 2020

Legend

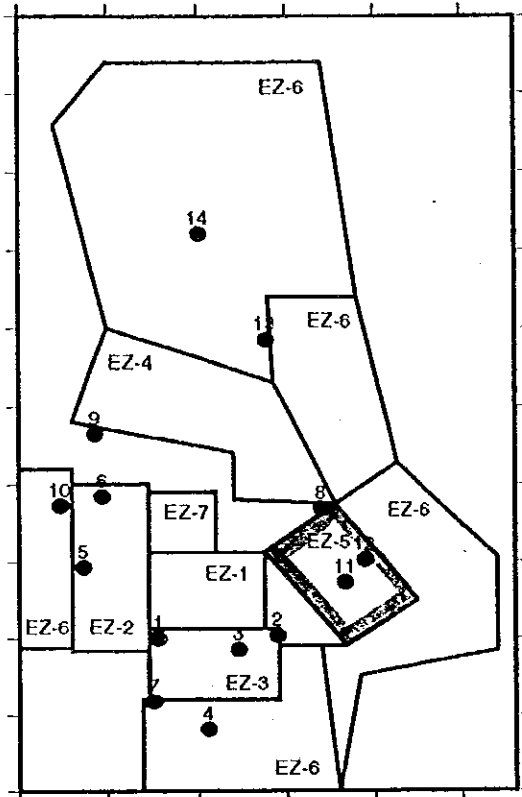
- Polluted
- Slightly Polluted
- Un-Polluted

Number	Industrial Zone
1	Thuong Dinh
2	Minh Khai - Vinh Tuy
3	Truong Dinh - Hoang Mai
4	Van Dien - Phap Van
5	Cau Dien - Mai Dich
6	Chem
7	Cau Buoi
8	Duc Giang - Gia Lam - Yen Vien
9	North Thang Long
10	South Thang Long
11	Sal Dong A
12	Sal Dong B
13	Dong Anh
14	Soc Son

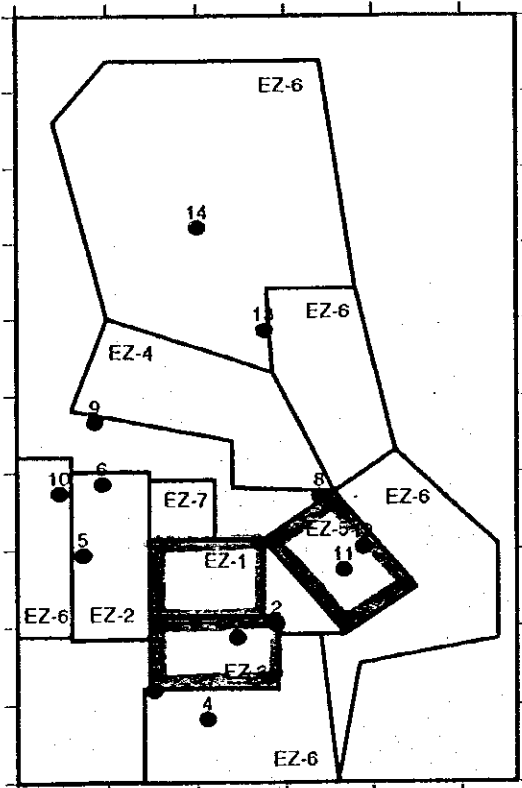
Figure 2-6
Air Pollution Condition (NO_x)
without Countermeasures



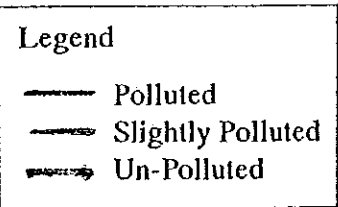
Present



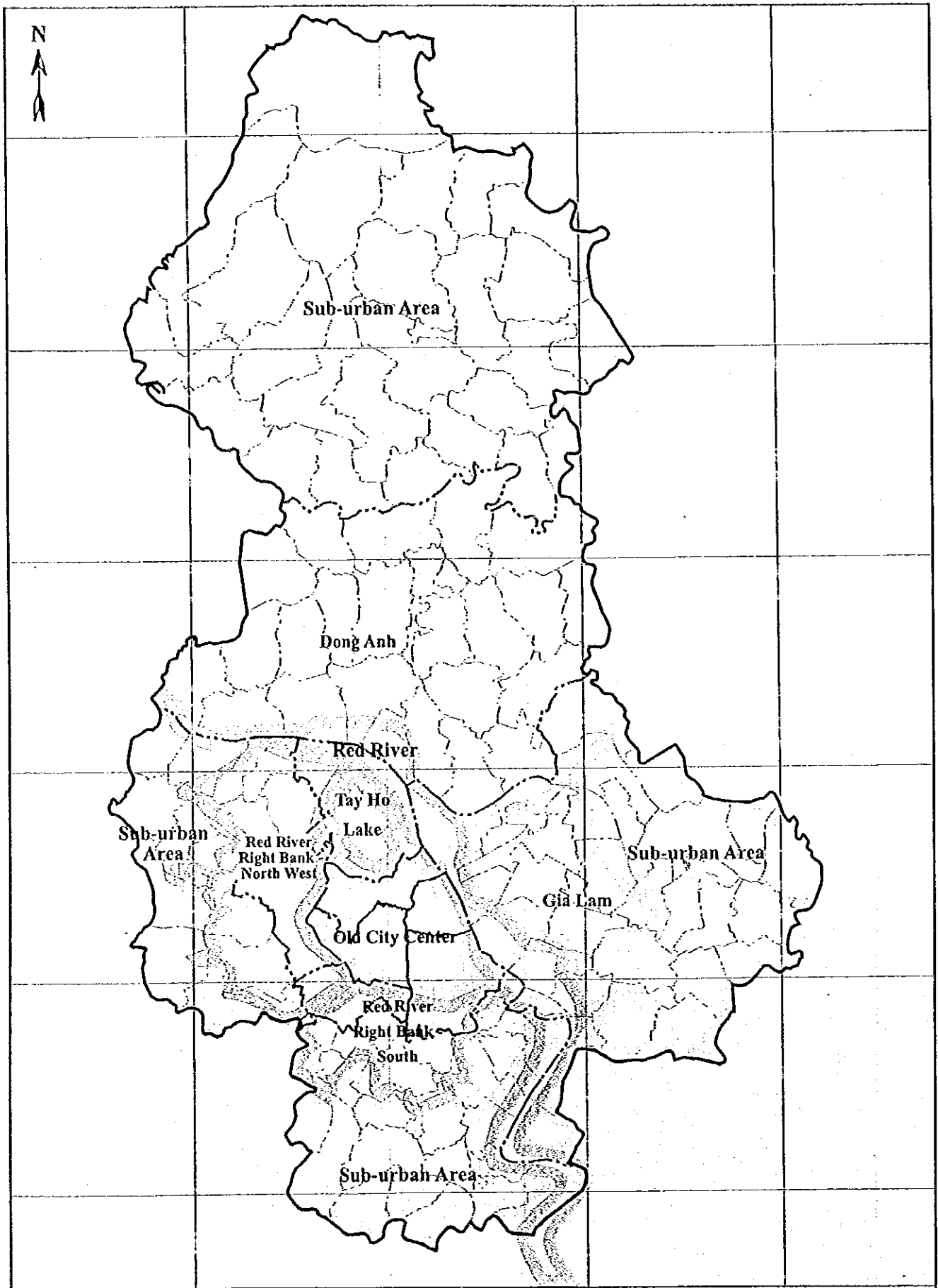
Year 2010



Year 2020



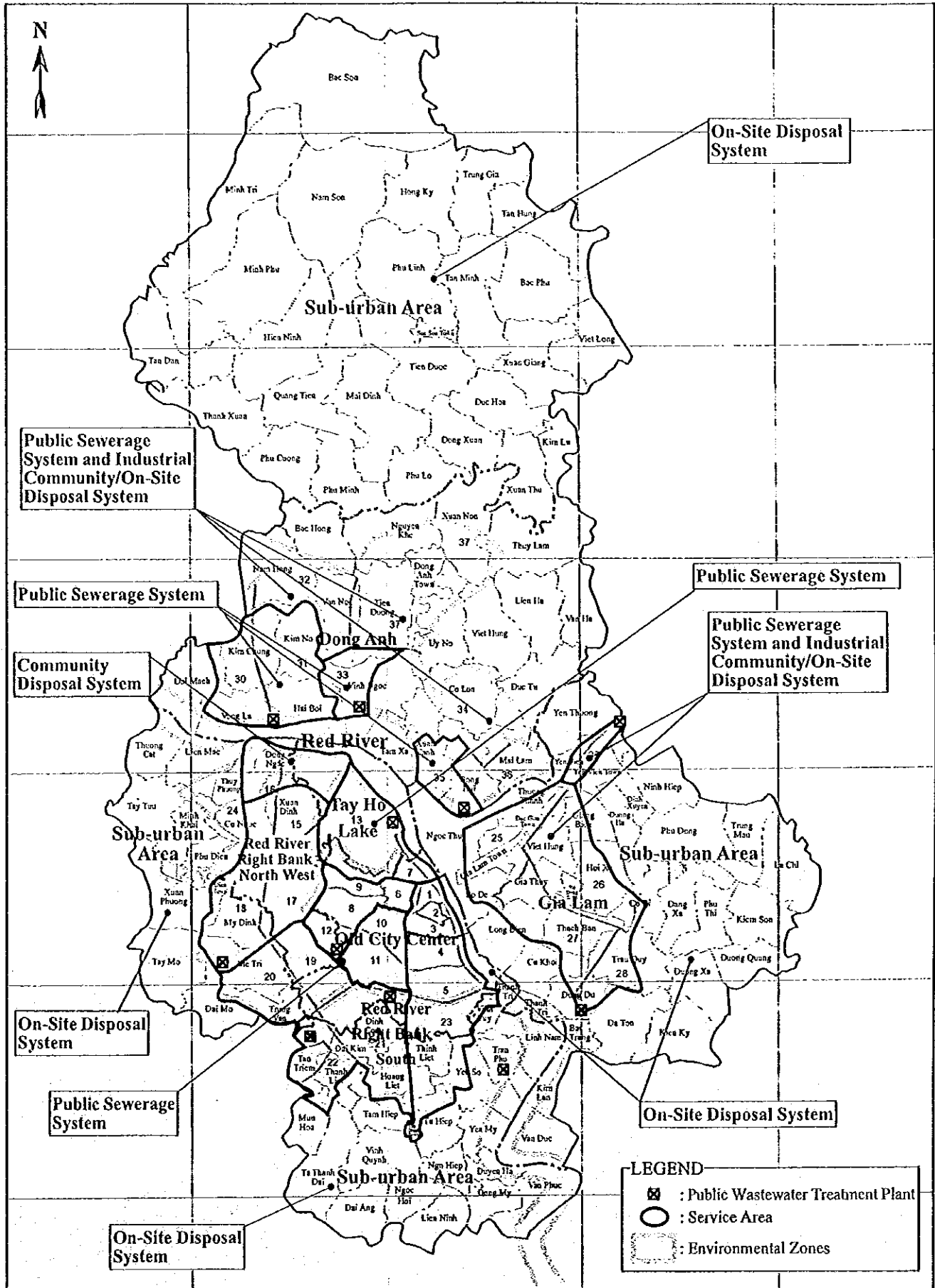
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1	Thuong Dinh
2	Minh Khai - Vinh Tuy
3	Truong Dinh - Hoang Mai
4	Van Dien - Phap Van
5	Cau Dien - Mai Dich
6	Chem
7	Cau Buoi
8	Duc Giang - Gia Lam - Yen Vien
9	North Thang Long
10	South Thang Long
11	Sai Dong A
12	Sai Dong B
13	Dong Anh
14	Soc Son



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Figure 3-1
Environmental Zoning

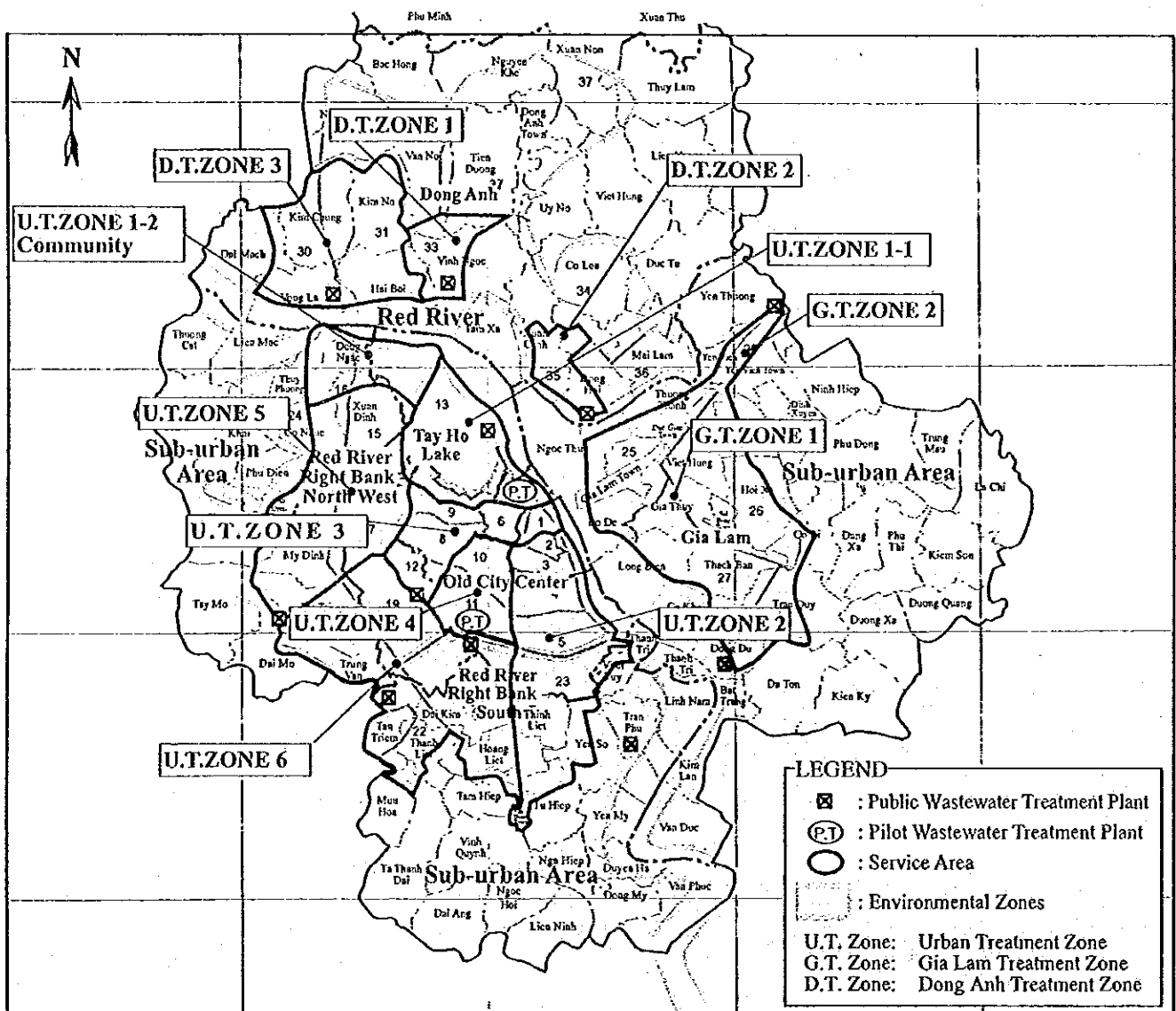


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Figure 4-1

Sewerage and Sanitation
Development Plan

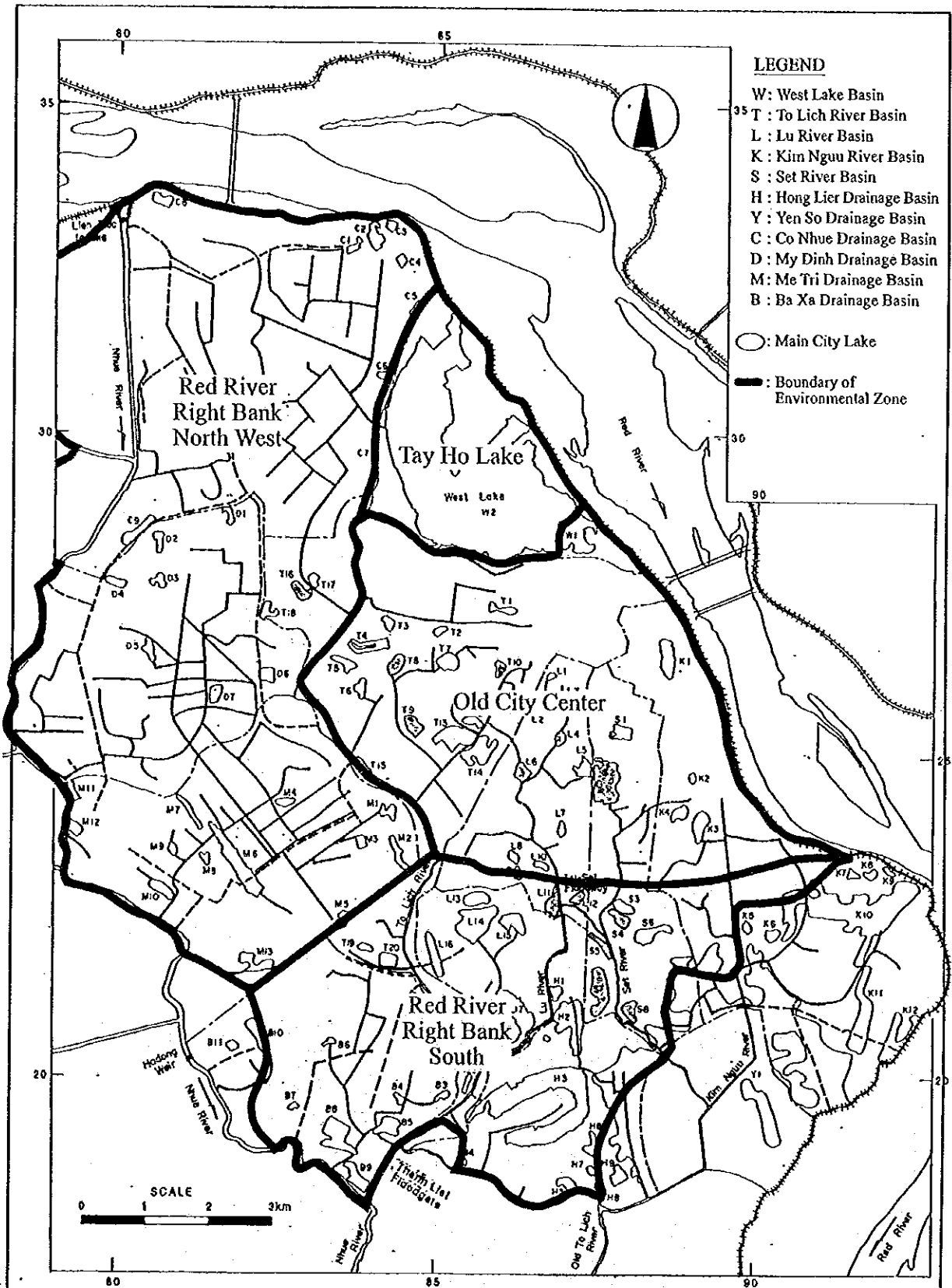


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Figure 4-2

Zoning Plan for Public Sewerage Development



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FOR HANOI CITY

Figure 4-3

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Main City Lakes Improvement

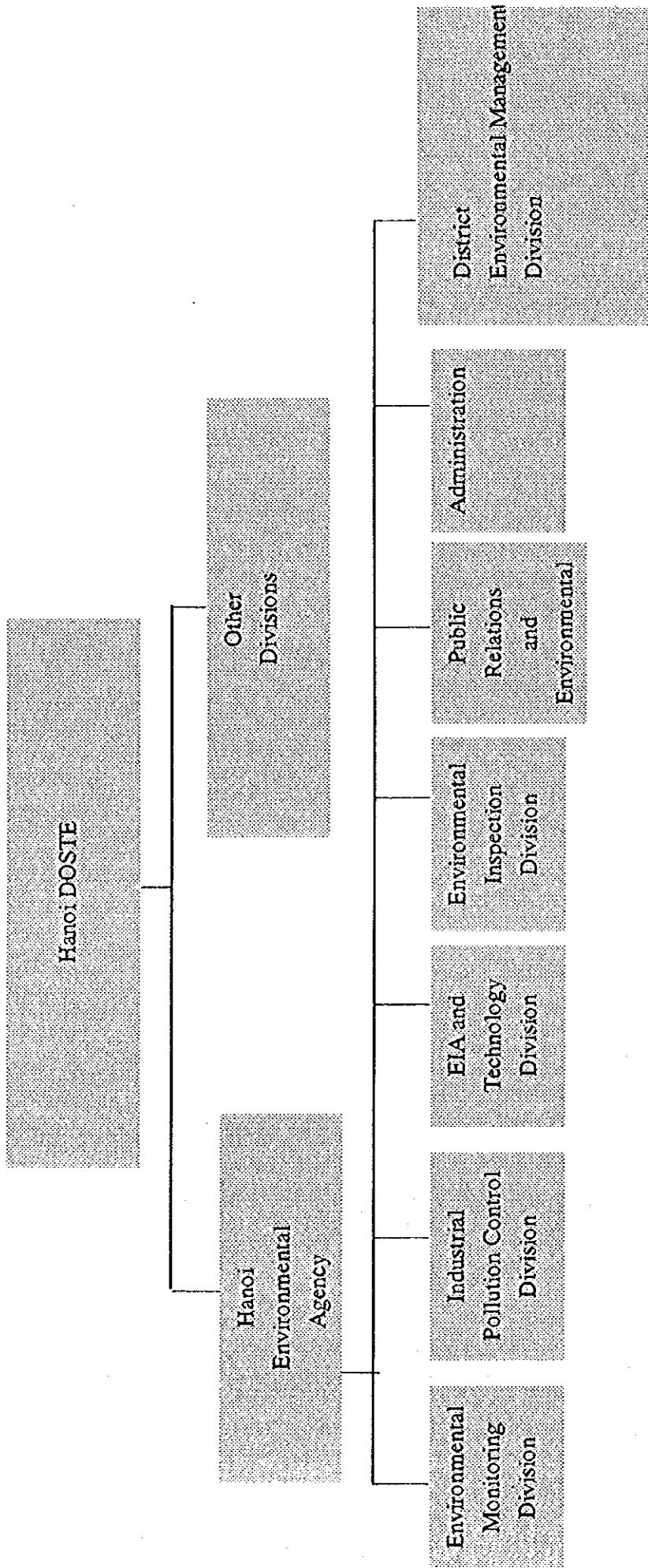


Figure 4-4 Hanoi Environmental Agency

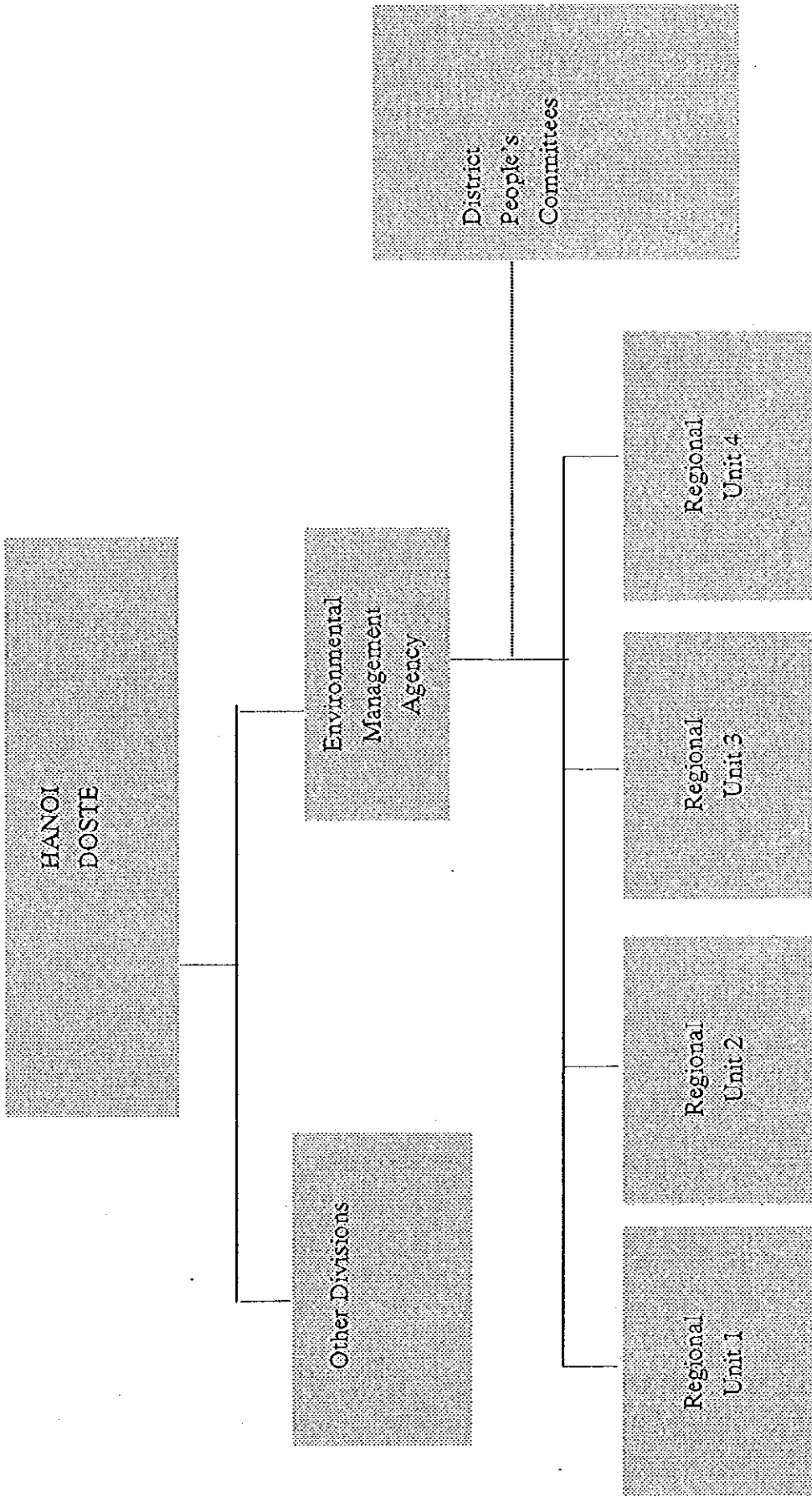
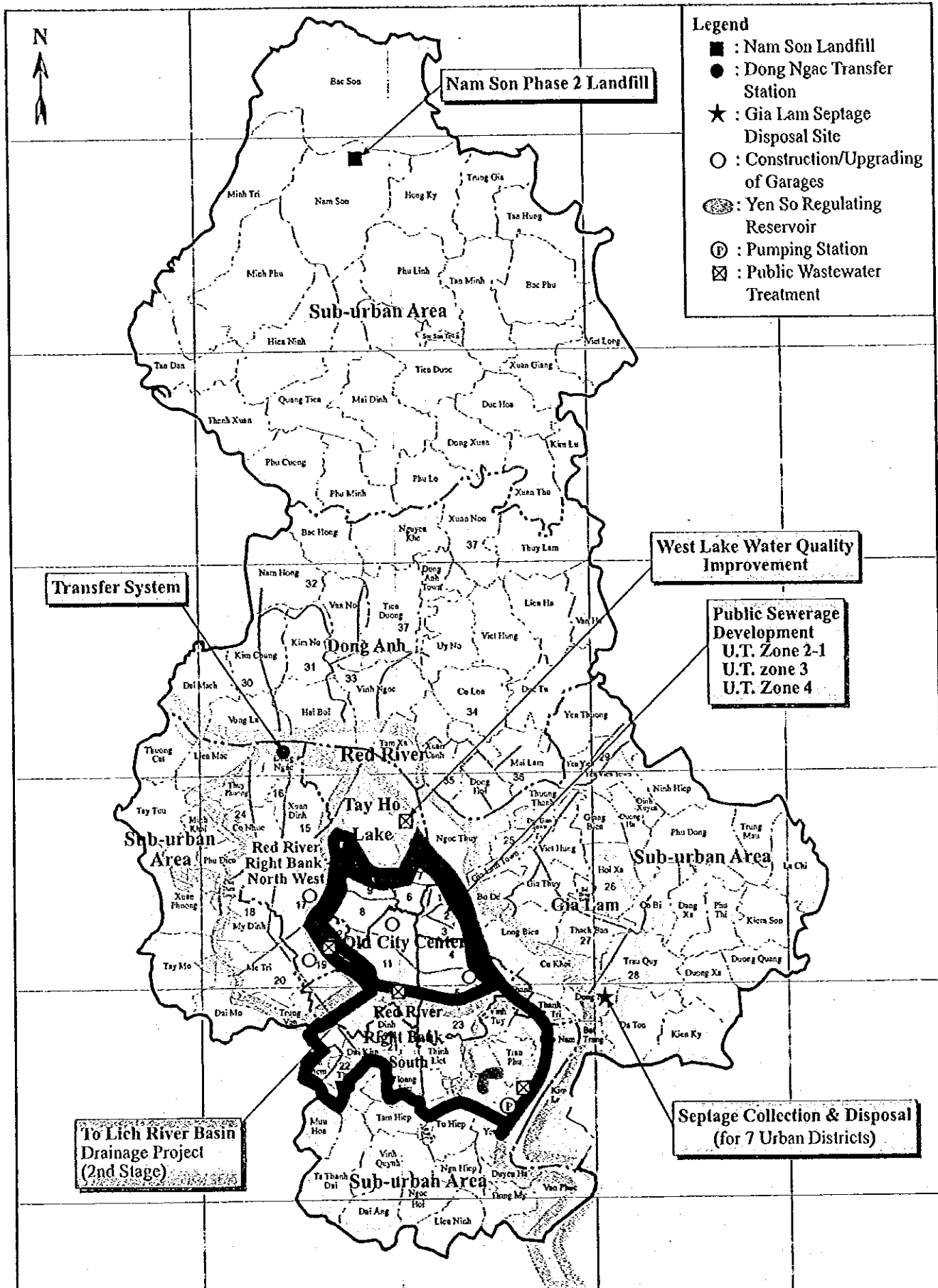


Figure 4-5 District Environmental Management Responsibility in Regional Unit in EMA



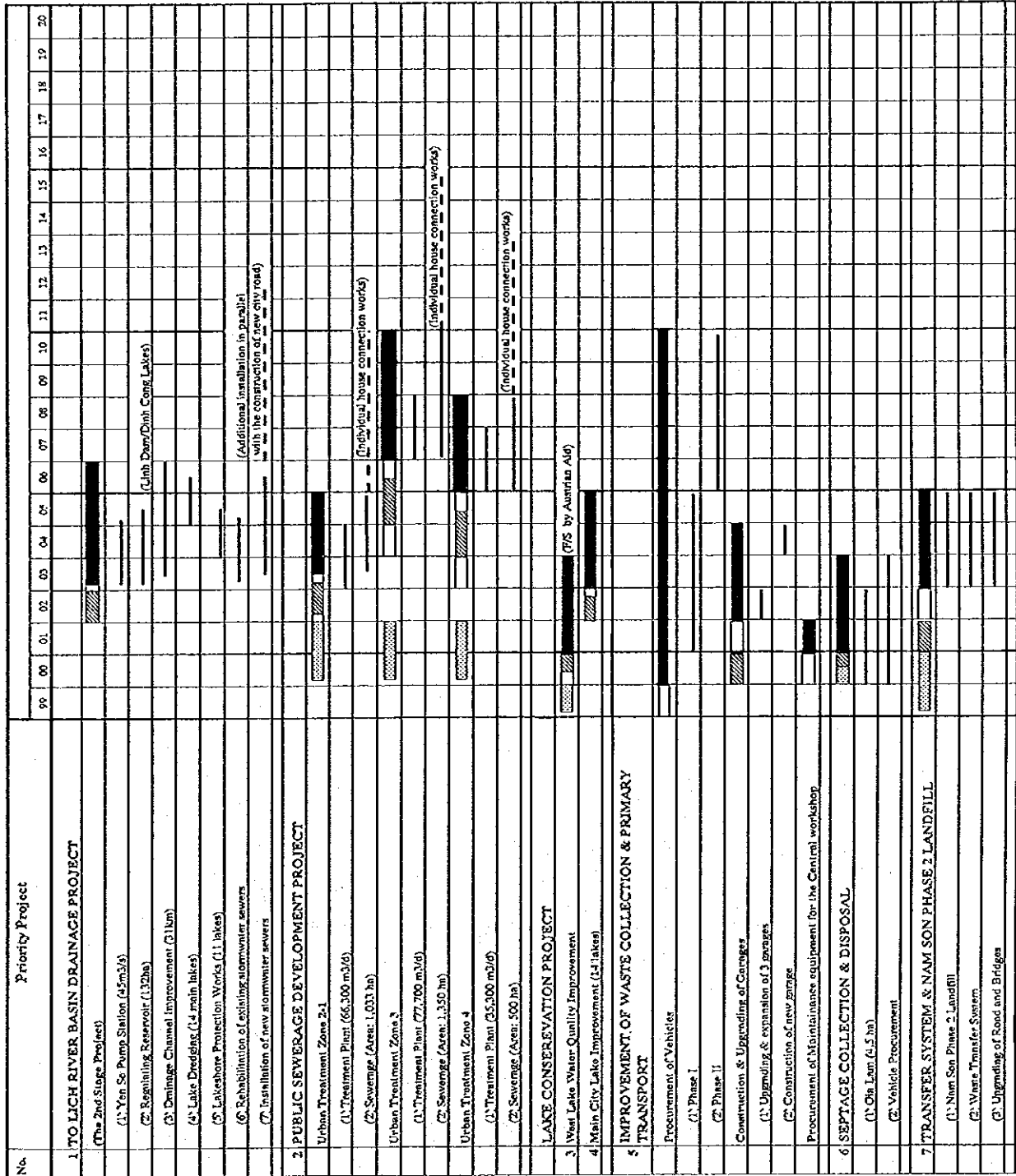
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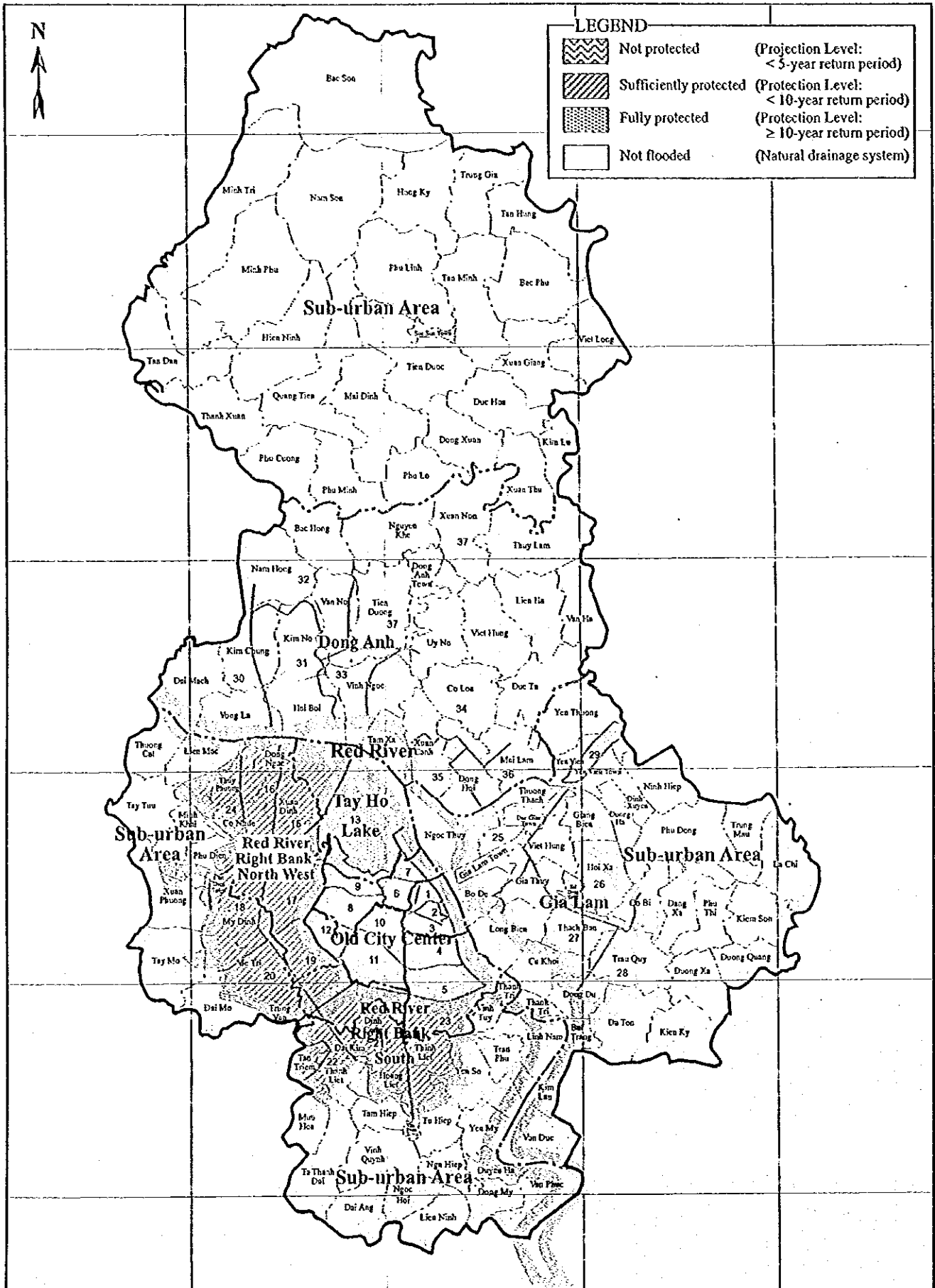
Figure 5-1

Development Plan of
 Priority Project

Figure S-2 Implementation Schedule of Priority Projects



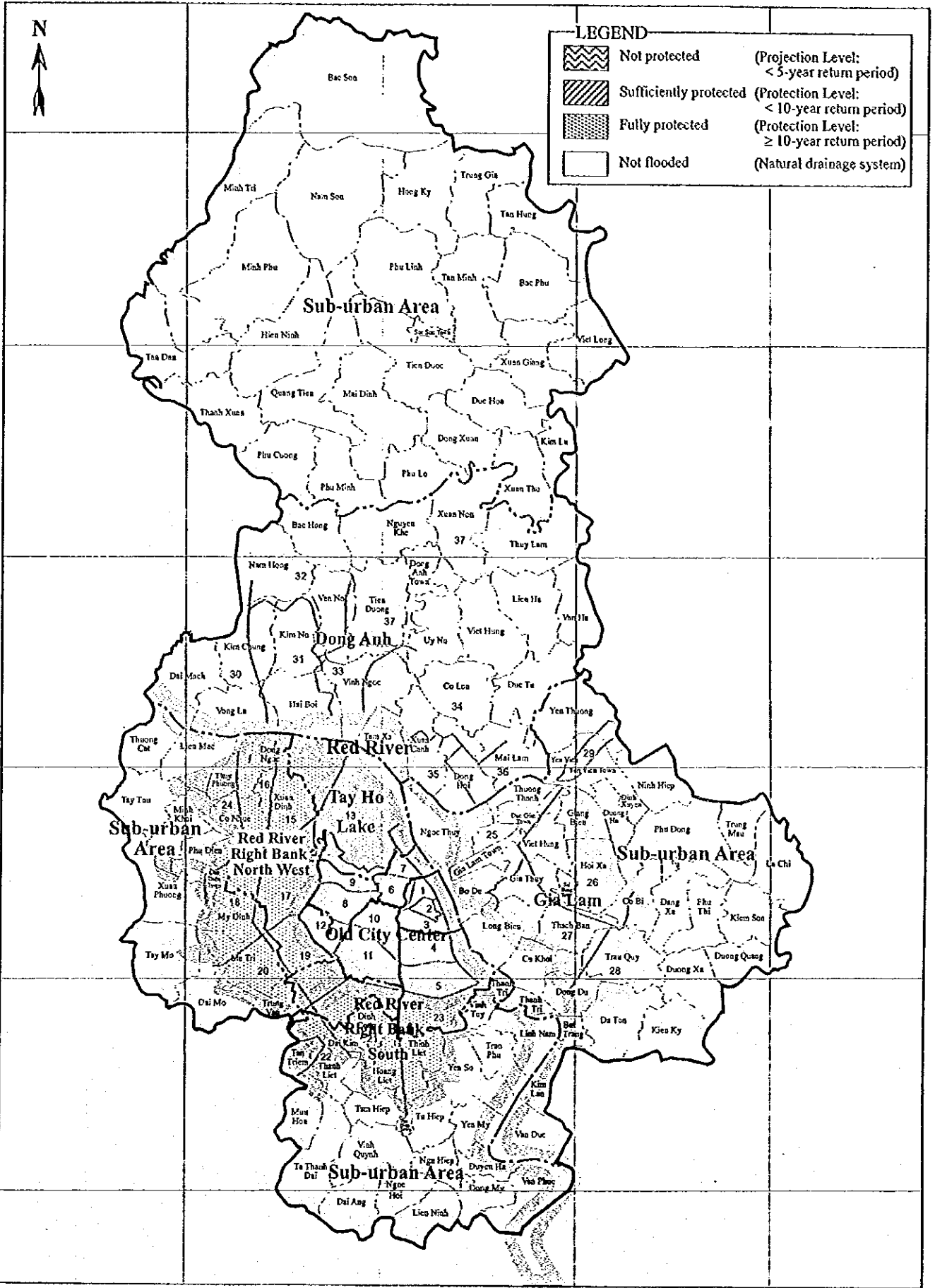
Study
 Design
 Financial/ Tender/ Contract
 Construction
 Intermittent Implementation



THE STUDY ON ENVIRONMENTAL IMPROVEMENT FOR HANOI CITY

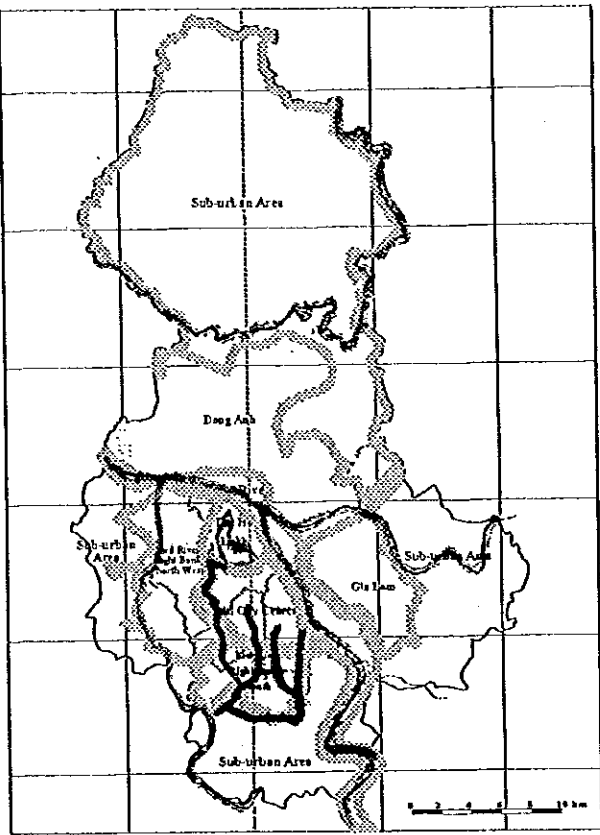
JAPAN INTERNATIONAL COOPERATION AGENCY

Figure 6-1
Water-related Sanitary Conditions
With Countermeasures (2010)

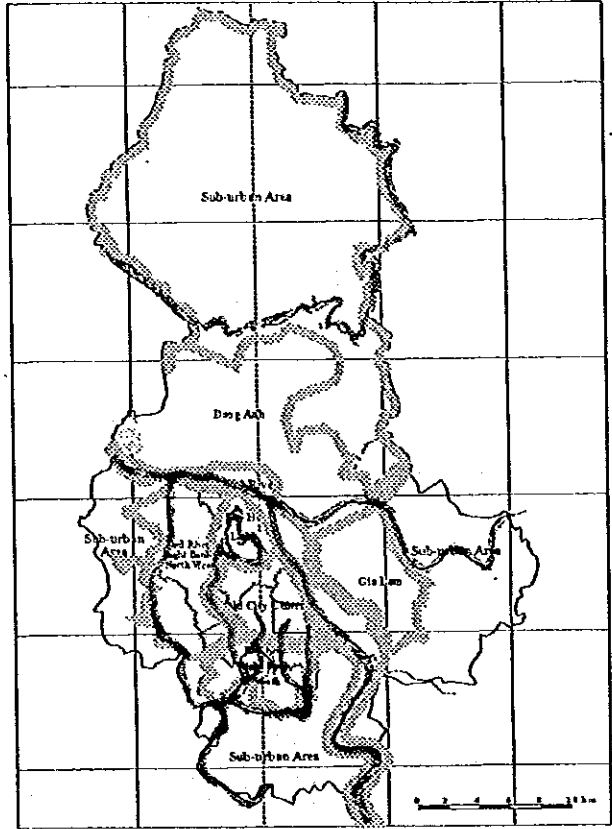


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 JAPAN INTERNATIONAL COOPERATION AGENCY

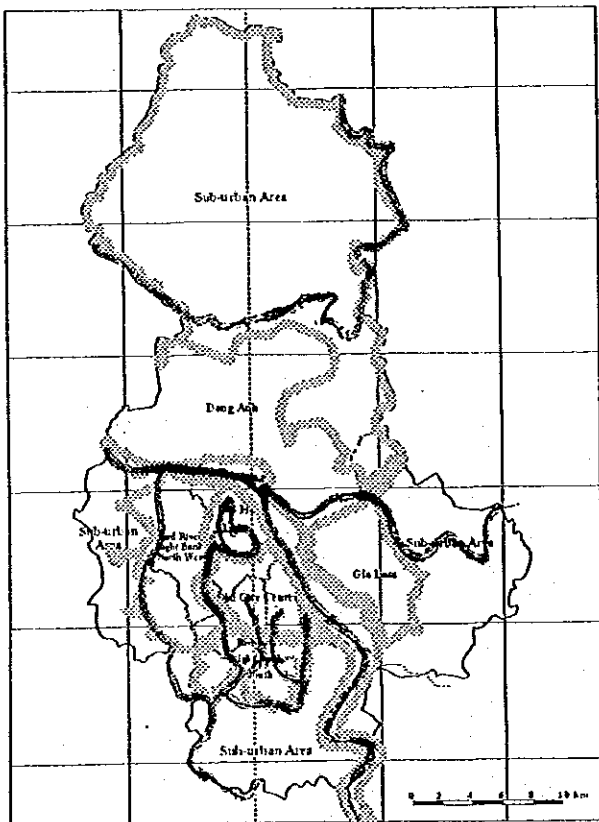
Figure 6-2
 Water-related Sanitary Conditions
 With Countermeasures (2020)



Present






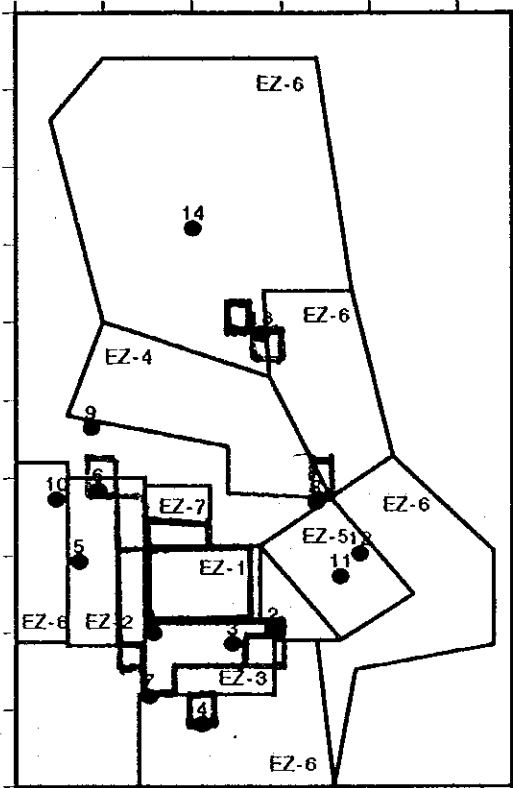
Year 2010



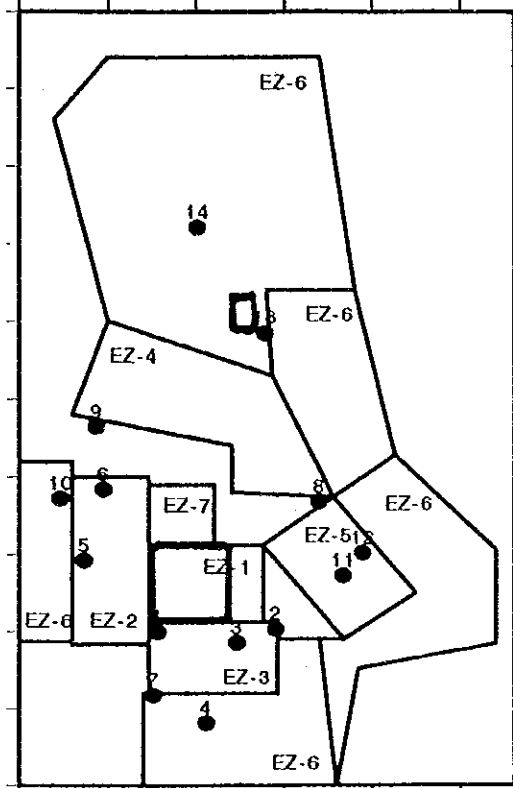
Year 2020

Legend

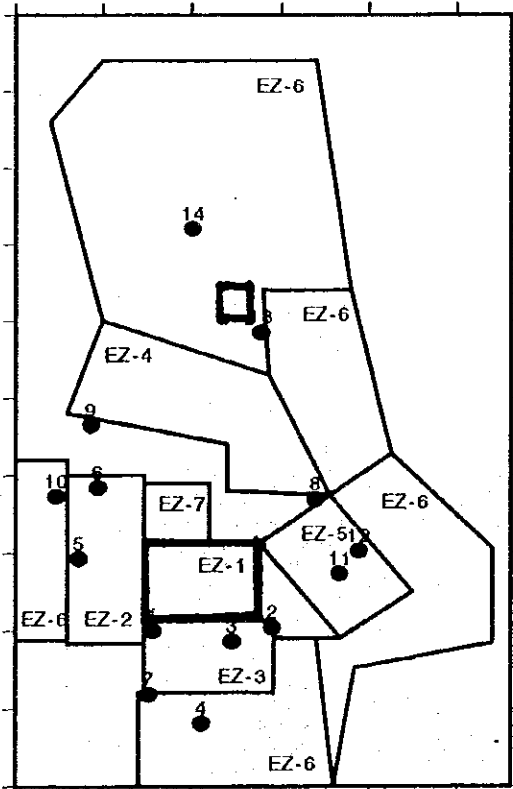
-  Polluted
-  Slightly Polluted
-  Un-Polluted



Present



Year 2010

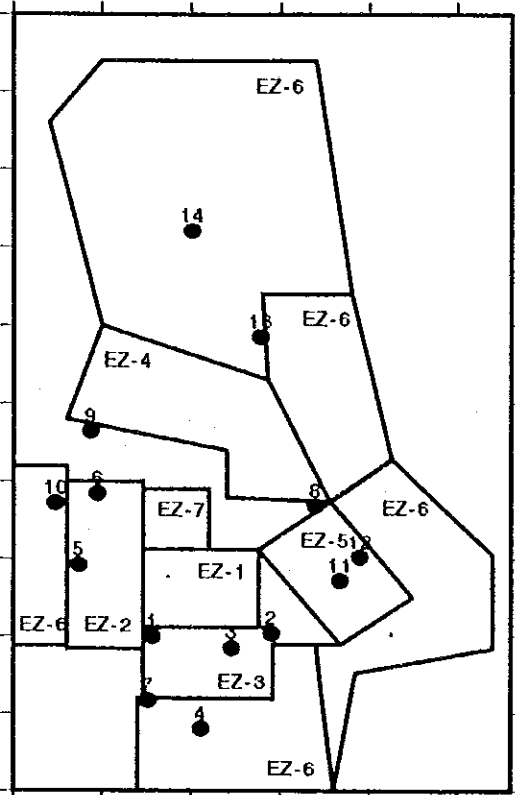


Year 2020

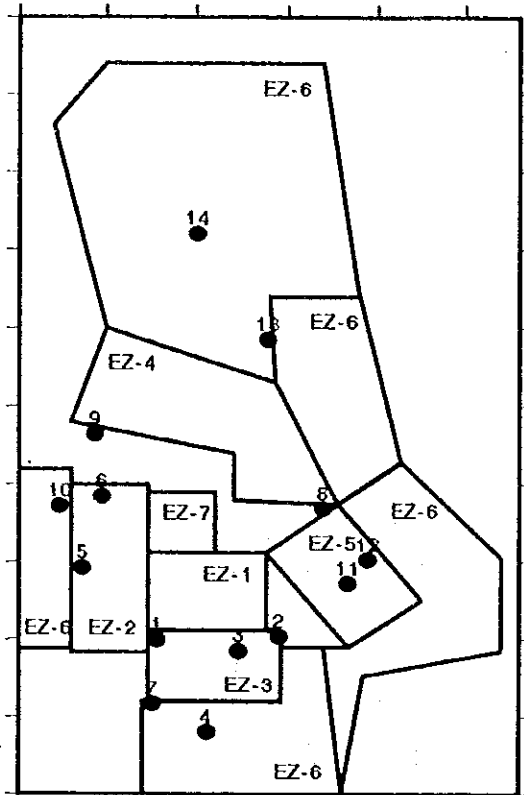
Legend

- Polluted
- Slightly Polluted
- Un-Polluted

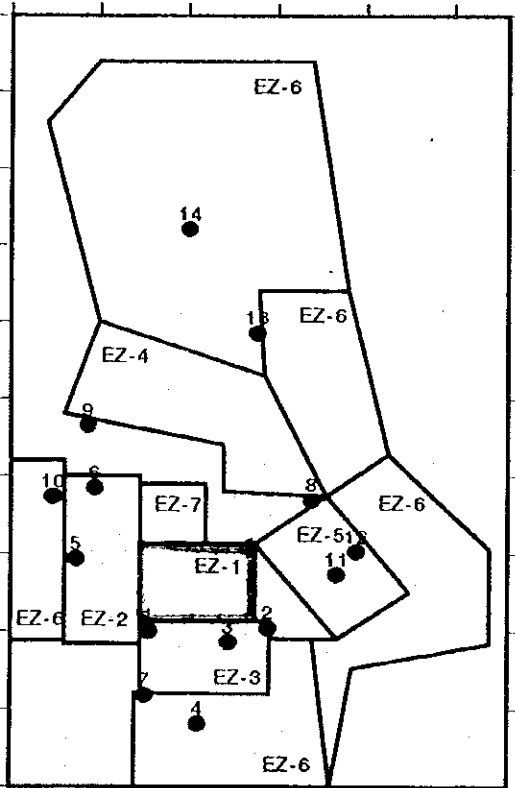
Number	Industrial Zone
1	Thuong Dinh
2	Minh Khai - Vinh Tuy
3	Truong Dinh - Hoang Mai
4	Van Dien - Phap Van
5	Cau Dien - Mai Dich
6	Chem
7	Cau Buou
8	Duc Giang - Gia Lam - Yen Vien
9	North Thang Long
10	South Thang Long
11	Sai Dong A
12	Sai Dong B
13	Dong Anh
14	Soc Son



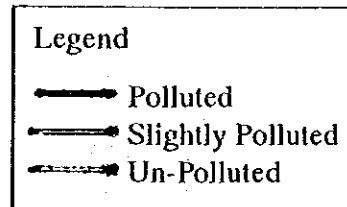
Present



Year 2010



Year 2020



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1	Thuong Dinh
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