

APPENDIX-G

INVESTMENT DEMAND FOR INDUSTRIAL ESTATES

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APPENDIX-G

INVESTMENT DEMAND FOR INDUSTRIAL ESTATES

G.1 Investment Demand of Vietnamese Enterprises

- 1) Investment Demand Survey in Vietnam
- (1) Target Enterprises of Investment Demand Survey

The possibility of establishing of factories in the potential industrial estates in the Hanoi area has been investigated by means of a questionnaire survey conducted by the Study Team, under subcontract to a local consultant. The questionnaire survey (first survey) was carried out simultaneously with the industrial production survey for the existing enterprises in the Hanoi area in order to know the conditions of production in September 1994. A total of 291 enterprises, comprising 194 central state enterprises, 83 local state enterprises, and 14 private enterprises listed by HPC have been requested to fill out the questionnaire form. The major items of the questionnaire are:

- Interest in locating factories within the planned industrial estate,
- Preference among the four sites,
- Required area of factory lots,
- Number of workers to be employed,
- Expected investment amount,
- Kinds of products to be produced,
- Expected markets,
- Preference for foreign joint venture,
- Required capacities of utilities,
- Desirable level of land rent.

(2) Number of Replies

Of the 291 enterprises surveyed, 234 firms or about 80% replied to the questionnaire survey as summarized below.

Number of Replies to Investment Demand Survey in Vietnam

	No. of Samples	Replies	
		Number	%
Central State Enterprises	194	154	79.4
Local State Enterprises	83	70	84.3
Private Enterprises	14	10	71.4
Total	291	234	80.4

2) Investment Demand Perceived by the First Survey

(1) Investment demand by industrial category and by type of enterprise

Of the 234 enterprises that replied to the questionnaire, 103 firms showed interest in the proposed industrial estates development. Investment demand by industrial category for each type of enterprise is shown in Table G.01. As seen in the table, 51 firms are keenly interested and 52 firms are interested in investing in the industrial estates. Among the industrial categories, electrical machinery, textile/wearing apparel, and food/beverage industries are dominant (refer to Table G.02).

(2) Reasons for site preference

The number of interested firms by alternative sites for industrial estate is shown in Table G.03. Reasons for preference with regard to the proposed industrial estates are shown in Table G.04. As seen in the table, the Thang Long South Area is preferred because of the following reasons:

- a) Adequate infrastructure including electricity and water supply
- b) Relatively good accessibility to Noi Bai International Airport
- c) Relatively good accessibility to Hai Phong port
- d) Access to cheap and abundant labor force

(3) Requirements for the estate sites

The major requirements for investment in the proposed estate sites are summarized below.

- a) Land rental system ---Long-term land rental system (20-50 years lease)
- b) Long-term land rental fee ---Less than 100,000 dongs/m²/yr.
- c) Required land area for factory lots ---1~2 (ha), 2~5 (ha)
- d) Water requirement ---100~500 (m³/day)
- e) Electricity requirement ---100~10,000 (kW)
- f) Necessity of incentives---Easy access to loans, export and import duties exemption/reduction, turnover tax exemption/reduction, profit tax exemption/reduction

3) Reconfirmed Investment Demand

For the 51 very prospective enterprises, an interview survey were directly conducted by an expert of the Study Team in order to reconfirm the degree of interest in investing in the proposed industrial estates. Out of these enterprises, interviews with 35 firms were conducted in the period from December 1994 to January 1995*. The results of the interview survey are summarized below.

* The remaining 16 firms rejected the interview because of their work load at the end of fiscal year.

Degree of Interest	Definition	Number of Firms
PP	-Likely to invest	16
Others	-Possible to invest in the long run -After expanding the existing factory lot -Problem of financial arrangement -Possible to invest in other sites	19
Total		35

With regard to the 16 firms defined as "PP", the major findings through the reconfirmation interview are summarized below.

a) First Preference for location

- Thang Long North : 1 firm
- Thang Long South : 5 firms
- Dong Anh Area : 1 firm
- Gia Lam Area : 7 firms
- Soc Son Area : 2 firms

b) Major reasons for investment

- To improve old facilities/buildings
- To improve local conditions of the existing factory
- To expand production

c) Major objectives of investment

- To create a productive base for the Vietnamese market
- To create a productive base for exports

d) A majority of "PP" firms showed high interest in investing in other proposed industrial estates in addition to their first preference.

e) The 16 "PP" firms have detailed investment plans including production enhancement and financial arrangement.

- f) A majority of "PP" firms are willing to form joint ventures with foreign enterprises in order to introduce high technologies.

The interview results show that 16 enterprises out of the 51 surveyed would be potential investors in the proposed industrial estates in the Hanoi area.

G.2 Investment Demand of Foreign Enterprises

1) Investment Demand Survey in Japan

(1) Selection of Samples

In order to assess the degree of interest of the Japanese investors in the potential industrial estates in the Hanoi area, a mail questionnaire survey has been conducted by the Study Team, under a subcontract with a Japanese company. The survey was carried out in October 1994. 2,500 firms have been selected from the following inventories:

- a) Potential Investors Overseas, JETRO, 1994
- b) List of firms who attended the 1994 Investment Seminar in Japan
- c) List of Japanese Firms with Direct Investment Experiences Overseas, Tokyo Keizai, 1993
- d) Company Data Base as of 1993, Shokou Research Center

(2) Number of Replies

Of the 2,500 enterprises contacted, 341 firms gave replies, all of which were effective, with a response rate of 14%. The questionnaire included the following items, and the responses were analyzed in November 1994.

- Interest in investment in Vietnam
- Interest in establishing factories in the proposed industrial estates in and around the Hanoi area
- Required area of factory lots
- Number of workers to be employed
- Kinds of products to be produced
- Expected export ratio
- Required capacities of utilities
- Desirable level of land rent

2) Investment Demand Survey in NIEs and ASEAN Countries

(1) Selection of Samples

In order to assess the degree of interest in investment by investors in NIEs and ASEAN countries, a questionnaire survey was carried out under a subcontract with a Japanese survey firm in October 1994. Mail questionnaire survey was executed in

South Korean and interview survey was carried out in five other countries. About 500 firms were selected from the following inventories in each country:

a) Directory of Top 3,000 Korean Companies	South Korea
b) 1,000 Top Manufacturing Companies in Taiwan, 1992	Taiwan
c) Directory of Hong Kong Industries	Hong Kong
d) Manufacturers and Products Directory	Singapore
e) Federation of Malaysian Manufacturers, 1994	Malaysia
f) Million Baht Business Information Thailand, 1993	Thailand

(2) Number of Replies

The results of the investment demand survey in NIEs and ASEAN countries are shown below. Of a total of about 3,000 enterprises approached, more than 500 firms replied, with a response rate of 17%.

Numbers of Replies to the Investment Demand Survey in NIEs and ASEAN countries

	No. of Samples	Replies	
		Number	%
I. NIEs			
1. South Korea	500	35	7.0
2. Hong Kong	500	52	10.4
3. Taiwan	500	103	20.6
4. Singapore	500	100	20.0
II. ASEAN			
5. Malaysia	486	50	10.3
6. Thailand	500	182	36.4
Total	2,986	522	17.5

3) Investment Demand of Foreign Enterprises

(1) Investment Demand for Vietnam

The results of surveys on investment demand of foreign enterprises are summarized below. In Japan, of the 341 replies, 221 firms showed interest in overseas investment. Of these 221, 135 firms (about 61%) showed interest in investments in Vietnam. With regard to the enterprises in NIEs and ASEAN countries, of more than 500 replies, 173 firms showed interest in overseas investment. Of these 173 firms, 54 firms (about 31%) showed interest in investment in Vietnam. In total, of the 394 enterprises that are interested in overseas investment, 189 firms (about 48%) showed interest in investment in Vietnam.

	Japan	South Korea	Hong Kong	Taiwan	Singapore	Malaysia	Thailand	Total
Yes	135 (61.1%)	21 (67.7%)	3 (16.7%)	13 (19.7%)	7 (21.2%)	4 (25.0%)	6 (66.7%)	189 (48.0%)
No	80 (36.2%)	8 (25.8%)	15 (83.3%)	53 (80.3%)	26 (78.8%)	12 (75.0%)	2 (22.2%)	196 (49.7%)
No reply	6 (2.7%)	2 (6.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1 (11.1%)	9 (2.3%)
Total	221 (100.0%)	31 (100.0%)	18 (100.0%)	66 (100.0%)	33 (100.0%)	16 (100.0%)	9 (100.0%)	394 (100.0%)

(2) Investment Demand for the Hanoi Area

The results of surveys on investment demand of foreign enterprises for the Hanoi area are summarized below. Of the 189 enterprises that showed interest in investment in Vietnam, 97 firms were interested in investing in the industrial estates in the Hanoi area. Of these 97 enterprises, 9 firms marked "Likely to invest", and 88 firms marked "Possible to invest".

	Japan	South Korea	Hong Kong	Taiwan	Singapore	Malaysia	Thailand	Total
Yes	2 (1.5%)	4 (19.0%)	0 (0.0%)	1 (7.7%)	1 (14.3%)	0 (0.0%)	1 (16.7%)	9 (4.8%)
Possibly	65 (48.1%)	10 (47.6%)	0 (0.0%)	4 (30.8%)	1 (14.3%)	4 (100.0%)	4 (66.7%)	88 (46.6%)
No	48 (35.6%)	7 (33.3%)	3 (100.0%)	7 (53.8%)	5 (71.4%)	0 (0.0%)	1 (16.7%)	71 (37.6%)
No reply	20 (14.8%)	0 (0.0%)	0 (0.0%)	1 (7.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	21 (11.1%)
Total	135 (100.0%)	21 (100.0%)	3 (100.0%)	13 (100.0%)	7 (100.0%)	4 (100.0%)	6 (100.0%)	189 (100.0%)

The preference of industrial sites in the Hanoi area is shown in Table G.05. The reply "Not fixed for the sites at present" is dominant. Among the proposed sites, the highest degree of interest is shown for the Gia Lam area. Reasons for preference are presumed to be good accessibility to the Hai Phong port and a short distance from the center of the city.

The major requirements for investment in the proposed estate sites are summarized below.

- | | | |
|--|---|------------------------------|
| a) Required land area for factory lots | : | 1~5(ha) |
| b) Water requirement | : | 100~500(m ³ /day) |
| c) Electricity requirement | : | 1000~5000(kW) |

G.3 Overall Investment Demand

1) Investment Demand of Foreign Enterprises

(1) Reconfirmed Investment Demand in Japan

Subsequent to the mail questionnaire survey, an interview survey was conducted in November 1994 and January 1995 to confirm the degree of interest and the requirements of 19 enterprises out of the 67 that gave positive responses.

Thirty of the 67 enterprises showed interest in investment in the South Region (Ho Chi Minh, etc.) in the questionnaire survey, as shown in Table G.06. It can be presumed that these enterprises will probably not invest in the proposed industrial estates in the Hanoi area. The other 37 enterprises, that showed interest in investment in the North Region (Hanoi, Hai Phong, etc.) but did not indicated the exact areas for investment, were selected as target enterprises of the interview survey.

Nineteen of the 37 firms were contacted for the interview survey. The results of the interview survey are summarized below. Ten enterprises (about half the target enterprises) are defined as "PP" firms and 7 enterprises are defined as "P" firms.

Degree of Interest	Definition	Number of Firms
*1 PP	- Likely to invest	10
*2 P	- Possible to invest - Subject to detailed study on Vietnamese market, quality of labor and labor cost - After service activity such as retail business	7
Others	- Possible to invest in Hai Phong and Cai Lan	2
Total		19

*1 PP is defined as very prospective enterprises to invest in the proposed industrial estates.

*2 P is defined as prospective enterprises to invest in the proposed industrial estates.

The results reconfirmed that 17 Japanese firms were likely to invest in the proposed industrial estates in the Hanoi area. Though the other 18 enterprises of the above 37 firms could not be contacted for the interview survey, 16 of them could be assumed as "P" firms judging from the questionnaire survey results.

Consequently, it is presumed that there is a strong possibility that 33 enterprises will invest in the proposed industrial estates in the Hanoi area.

(2) Investment Demand of Foreign Enterprises

Among the prospective enterprises that marked "Likely to invest" or "Possible to invest" in the investment demand surveys conducted in Japan, NIEs, and ASEAN countries, the enterprises with a high possibility of investment in the proposed industrial estates in the Hanoi area were screened on the following basis:

- a) Results of the reconfirmation interview survey in Japan
- b) Willing to invest in the North Region of Vietnam and in the proposed industrial estates in the Hanoi area
- c) Suitable industrial category (for example, NIEs cement and oil firms identified in the questionnaire survey are not suitable.)

As a result of this screening, enterprises with a high probability of investment have been identified as shown below.

Numbers of Enterprises with High Probability of Investment in the Proposed Industrial Estates

	No. of Prospective Enterprises in Questionnaire Survey	No. of Enterprises with High Probability of Investment
I. Japan	67	33
II. NIEs		
1. South Korea	14	7
2. Hong Kong	0	0
3. Taiwan	6	0
4. Singapore	2	1
III. ASEAN		
1. Malaysia	4	2
2. Thailand	5	1
Total	98	44

On the basis of the expansion coefficient, shown in Table G.07, which is equivalent to the reciprocal of the sampling ratio, the investment demand by the Japanese, NIEs and ASEAN's enterprises for the proposed industrial estates has been estimated as summarized in Table G.08. As seen in the table, the total number of highly prospective foreign enterprises is projected to be 399 firms.

For reference, the investments by Japanese enterprises in Asian countries is summarized below. Taking these numbers into consideration, the estimated number for the Hanoi area (about 400) seems to be reasonable.

Investments of Japanese Enterprises in Each Asian Country

			(Projects)
Invested Countries	No. of Projects		Remarks
Thailand	548	(1988-93/July)	50% in manufacturing sector
Indonesia	168	(1991-93/Sep.)	75% in manufacturing sector
China	7,182	(1979-93)	80% in manufacturing sector
Malaysia	223	(1992-93/Aug.)	

2) Investment Demand of Vietnamese Enterprises

With regard to Vietnamese prospective enterprises, 16 firms will most probably invest, as mentioned in Section G.1. However, taking into consideration the fact that Vietnamese enterprises are likely to form joint ventures with foreign companies, the total number of highly prospective enterprises in Vietnam is assumed to be included in the number of potential foreign investors, i.e. about 400.

3) Overall Investment Demand

The overall investment demand can be determined at about 400 firms as shown below. The estimated demand for investments is evaluated to be sufficient for the development of the proposed industrial estates in the Hanoi area at the initial stage.

Overall Investment Demand for the Proposed Industrial Estates

	Overall Investment Demand
I. Vietnam	(16) *
II. Japan	362
III. NIEs	
1. South Korea	29
2. Hong Kong	0
3. Taiwan	0
4. Singapore	1
IV. ASEAN	
1. Malaysia	4
2. Thailand	3
Total	399

* Not included in the total figure.

Table G.01 Number of Prospective Vietnamese Enterprises by Industrial Category for Each Type of Enterprise

Type of Enterprise	Very Prospective				Prospective			
	Central State		Private		Central State		Private	
	Enterprise	Local State	Enterprise	Sub-Total	Enterprise	Local State	Enterprise	Total
Category	Enterprise	Local State	Enterprise	Sub-Total	Enterprise	Local State	Enterprise	Total
311 Food manufacturing	1	1	0	2	3	2	0	5
313 Beverage industries	1	1	1	3	2	2	0	4
314 Tobacco	0	0	0	0	0	0	0	0
321 Textile	3	0	0	3	4	4	1	9
322 Apparel	0	1	0	1	1	0	0	1
323 Leather products	0	0	0	0	1	0	0	1
324 Footwear	0	0	0	0	0	0	0	0
331 Wood & cork	1	0	1	2	0	0	0	2
332 Furniture	0	0	1	1	0	0	0	1
341 Paper	0	1	0	1	0	0	0	1
342 Printing	1	1	0	2	3	0	0	3
351 Chemicals	1	0	0	1	0	0	0	1
352 Other chemicals	1	0	0	1	4	0	0	5
355 Rubber products	1	1	0	2	0	3	0	3
356 Plastic products not classified elsewhere	0	0	0	0	3	2	0	5
361 Pottery, china ware	1	1	0	2	0	0	0	2
362 Glass & glass products	0	1	0	1	1	0	0	2
369 Other non-metal mineral	4	1	0	5	0	0	0	5
371 Iron & steel	0	0	0	0	1	0	0	1
372 Non-ferrous metal	1	1	0	2	0	0	0	2
381 Fabricated metal	1	0	0	1	0	0	0	1
382 Machinery	1	1	0	2	3	1	0	6
383 Electrical machinery	7	3	1	11	1	2	1	15
384 Transport equipment	2	2	1	5	2	1	0	8
385 Professional equipment	0	1	0	1	1	1	0	3
390 Other manufacturing	1	1	0	2	2	0	0	4
Total	28	18	5	51	32	18	2	103

Table G.02 Industrial Category of Vietnamese Very Prospective and Prospective Enterprises (1/2)

Classification	Very Prospective Enterprises	Ratio (%)	Prospective Enterprises	Ratio (%)	Total	Ratio (%)
311 Food manufacturing						
3111 Meat						
3112 Daily products	1	2.0%	2	3.8%	3	2.9%
3113 Canning fru., veg.						
3114 Canning of fish						
3115 Oil						
3116 Grain mill						
3117 Bakery products	0	0.0%	3	5.8%	3	2.9%
3118 Sugar factories						
3119 Cocoa, chocolate						
3121 Not classified						
3122 Animal feed	1	2.0%			1	1.0%
313 Beverage industries						
3131 Distilling spirits						
3132 Wine	1	2.0%	2	3.8%	3	2.9%
3133 Malt liqueurs	1	2.0%			1	1.0%
3134 Soft drinks	1	2.0%	1	1.9%	2	1.9%
314 Tobacco						
321 Textile						
3211 Weaving						
3212 Made-up goods	3	5.9%	8	15.4%	11	10.7%
3213 Knitting mills						
3214 Carpets & rugs						
3215 Cordage, rope			1	1.9%	1	1.0%
3219 Not classified						
322 Apparel	1	2.0%	1	1.9%	2	1.9%
323 Leather products						
3231 Tanneries & leather						
3232 Fur dressing & dyeing			1	1.9%	1	1.0%
3233 Leather products						
324 Footwear						
331 Wood & cork						
3311 Sawmills						
3312 Wooden containers						
3319 Not classified	2	3.9%			2	1.9%
332 Furniture	1	2.0%			1	1.0%
341 Paper						
3411 Pulp, paper board						
3412 Containers & boxes						
3419 Not classified	1	2.0%			1	1.0%
342 Printing	2	3.9%	3	5.8%	5	4.9%
351 Chemicals						
3511 Basic chemicals						
3512 Fertilizers	1	2.0%			1	1.0%
3513 Resins, plastic						
352 Other chemicals						
3521 Paints, varnishes			3	5.8%	3	2.9%
3522 Drug & medicines						
3523 Soap, perfumes						
3529 Not classified	1	2.0%	1	1.9%	2	1.9%
353 Petroleum refineries						

Table G.02 Industrial Category of Vietnamese Very Prospective and Prospective Enterprises (2/2)

Classification	Very Prospective Enterprises	Ratio (%)	Prospective Enterprises	Ratio (%)	Total	Ratio (%)
354 Miscellaneous products of petroleum & coal						
355 Rubber products						
3551 Tyre & tube	1	2.0%			1	1.0%
3559 Not classified	1	2.0%	3	5.8%	4	3.9%
356 Plastic products not classified elsewhere	0	0.0%	5	9.6%	5	4.9%
361 Pottery, china ware	2	3.9%			2	1.9%
362 Glass & glass products	1	2.0%	1	1.9%	2	1.9%
369 Other non-metal minerals						
3691 Structural products	5	9.8%			5	4.9%
3692 Cement, lime & plaster						
3699 Not classified			1	1.9%	1	1.0%
371 Iron & steel/casting, forging			1	1.9%	1	1.0%
372 Non-ferrous metal	2	3.9%			2	1.9%
381 Fabricated metal						
3811 Cutlery, hand tools						
3812 Furniture	1	2.0%			1	1.0%
3813 Structural metal						
3819 Not classified						
382 Machinery						
3821 Engines			2	3.8%	2	1.9%
3822 Agri. machinery						
3823 Metal & wood			1	1.9%	1	1.0%
3824 Special						
3825 Office machinery			1	1.9%	1	1.0%
3829 Not classified	2	3.9%			2	1.9%
383 Electrical machinery						
3831 Indus. machinery	3	5.9%	3	5.8%	6	5.8%
3832 Radio, television	4	7.8%			4	3.9%
3833 Elect. housewares	1	2.0%	1	1.9%	2	1.9%
3839 Not classified	3	5.9%			3	2.9%
384 Transport equipment						
3841 Ship building			1	1.9%	1	1.0%
3842 Railroad						
3843 Motor vehicles	3	5.9%	1	1.9%	4	3.9%
3844 Bicycles	2	3.9%	1	1.9%	3	2.9%
3845 Aircraft						
3849 Not classified						
385 Professional equipment						
3851 Not classified	1	2.0%	2	3.8%	3	2.9%
3852 Photographic						
3853 Watches & clocks						
390 Other manufacturing						
3901 Jewellery			1	1.9%	1	1.0%
3902 Musical instruments			1	1.9%	1	1.0%
3903 Sporting goods	1	2.0%			1	1.0%
3909 Not classified	1	2.0%			1	1.0%
Total	51	100.0%	52	100.0%	103	100.0%

Table G.03 Preferable Locations of the Prospective Enterprises for the Proposed Industrial Estates

Location	No. of Very Prospective Enterprises	Ratio (%)	No. of Prospective Enterprises	Ratio (%)	Total	Ratio (%)
1) Soc Son Area	7	10.8%	0	0.0%	7	5.8%
2) Dong Anh Area	7	10.8%	7	12.5%	14	11.6%
3) Gia Lam Area	17	26.2%	12	21.4%	29	24.0%
4) Thang Long North Area	6	9.2%	5	8.9%	11	9.1%
5) Thang Long South Area	20	30.8%	21	37.5%	41	33.9%
6) Other Area	6	9.2%	6	10.7%	12	9.9%
7) No Reply	2	3.1%	5	8.9%	7	5.8%
Total	65	100.0%	56	100.0%	121	100.0%
Net Number of Firms	49		47		96	

N.B. Plural answers.

Table G.04 Preferable Reasons in regard to Location of the Vietnamese Highly Prospective Enterprises

Location Reasons	Soc Son (%)	Ratio (%)	Dong Anh (%)	Ratio (%)	Gia Lam (%)	Thang Long North (%)	Ratio (%)	Thang Long South (%)	Ratio (%)	Other Area (%)	Ratio (%)	Total	Ratio (%)
1) Relatively good accessibility to Hai Phong port	3	21.4%	6	26.1%	15	34.9%	4	26.7%	8	19.0%	1	37	25.5%
2) Relatively good accessibility to Noi Bai International Airport	5	35.7%	6	26.1%	8	18.6%	5	33.3%	10	23.8%	1	35	24.1%
3) Access to cheap and abundant labor force	2	14.3%	6	26.1%	8	18.6%	3	20.0%	8	19.0%	0	27	18.6%
4) Access to local resources (coal, iron ore, agricultural products etc.)	2	14.3%	1	4.3%	3	7.0%	1	6.7%	3	7.1%	0	10	6.9%
5) Adequate infrastructure including electricity and water supply	1	7.1%	4	17.4%	7	16.3%	2	13.3%	12	28.6%	5	31	21.4%
6) Others	1	7.1%	0	0.0%	2	4.7%	0	0.0%	1	2.4%	1	5	3.4%
Total	14	100.0%	23	100.0%	43	100.0%	15	100.0%	42	100.0%	8	145	100.0%
No. of Answers	7		7		17		6		20		6	63	
N.B. Plural answer													

Table G.05 Preference of Industrial Sites in the Hanoi Area for Foreign Investment

	Japan	South Korea	Hong Kong	Taiwan	Singapore	Malaysia	Thailand	(): % Total
a) Dong Anh Area along National Road No.3	3 (4%)	0 (0%)	0 -	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (3%)
b) North-Thang Long Area (west of Hanoi central area)	2 (3%)	1 (7%)	0 -	0 (0%)	0 (0%)	0 (0%)	0 (0%)	3 (3%)
c) South-Thang Long Area (west of Hanoi central area)	3 (4%)	0 (0%)	0 -	0 (0%)	1 (33%)	0 (0%)	0 (0%)	4 (4%)
d) Gia Lam Area along National Road No.5 connecting with Hai Phong	7 (10%)	1 (7%)	0 -	0 (0%)	1 (33%)	0 (0%)	2 (40%)	11 (11%)
e) Not fixed at present	45 (67%)	8 (57%)	0 -	5 (100%)	0 (0%)	4 (100%)	3 (60%)	65 (66%)
f) No reply	7 (10%)	4 (29%)	0 -	0 (0%)	1 (33%)	0 (0%)	0 (0%)	12 (12%)
Total	67 (100%)	14 (100%)	0 -	5 (100%)	3 (100%)	4 (100%)	5 (100%)	98 (100%)

Table G.06 Preferable Regions of Japanese Very Prospective and Prospective Enterprises

	Very Prospective Enterprises	Prospective Enterprises	Total
North region (Hanoi, Hai Phong, etc.)	1 (50%)	22 (34%)	23 (34%)
Central region (Da Nang, etc.)	0 (0%)	0 (0%)	0 (0%)
South region (Ho Chi Minh, etc.)	0 (0%)	30 (46%)	30 (45%)
Not fixed at present	1 (50%)	12 (18%)	13 (19%)
No reply	0 (0%)	1 (2%)	1 (1%)
Total	2 (100%)	65 (100%)	67 (100%)

Table G.07 Expansion Coefficient by Industrial Category to Estimate of Investment Demand for Each Country

Country	Japan		S. Korea		Hong Kong		Taiwan		Singapore		Malaysia		Thailand	
	Sampling Ratio*	Expansion Coefficient	Sampling Ratio	Expansion Coefficient	Sampling Ratio	Expansion Coefficient	Sampling Ratio	Expansion Coefficient	Sampling Ratio	Expansion Coefficient	Sampling Ratio	Expansion Coefficient	Sampling Ratio	Expansion Coefficient
Category														
311 Food manufacturing	0.011	90	0.325	3	0.036	28	0.473	2	0.389	3	0.541	2	0.402	2
313 Beverage industries	0.041	24	0.325	3	0.833	1	1.000	1	0.789	1	1.000	1	0.400	3
314 Tobacco	0.000	-	0.000	-	0.000	-	0.000	-	1.000	1	1.000	1	0.000	-
321 Textile	0.015	65	0.197	5	0.006	156	0.260	4	1.000	1	1.000	1	0.000	-
322 Apparel	0.057	17	0.667	2	0.007	149	1.000	1	1.000	1	1.000	1	0.367	3
323 Leather products	0.073	14	0.484	2	0.048	21	1.000	1	1.000	1	1.000	1	0.697	1
324 Footwear	0.211	5	0.429	2	0.085	12	1.000	1	1.000	1	1.000	1	0.188	5
331 Wood / cork	0.013	79	0.882	1	0.034	29	0.000	-	0.600	2	0.303	3	0.556	2
332 Furniture	0.027	37	0.000	-	0.026	38	1.000	1	0.375	3	0.357	3	0.813	1
341 Paper	0.016	61	0.250	4	0.013	76	0.741	1	0.682	1	0.400	3	1.000	1
342 Printing	0.005	202	0.200	5	0.002	498	0.741	1	0.455	2	0.714	1	0.313	3
351 Chemicals	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-	0.000	-
352 Other chemicals	0.006	173	0.117	9	0.029	35	0.179	6	0.139	7	0.909	1	0.500	2
355 Rubber products	0.004	272	0.172	6	0.000	-	0.455	2	0.833	1	0.217	5	0.290	3
356 Plastic products	0.003	298	0.000	-	0.003	380	0.139	7	0.104	10	1.000	1	0.304	3
361 Pottery, china ware	0.036	28	0.200	5	0.000	-	0.000	-	0.000	-	0.000	-	0.132	8
362 Glass / glass products	0.025	40	0.357	3	0.000	-	0.000	-	1.000	1	1.000	1	0.000	-
369 Other non-metal minerals	0.059	17	0.385	3	0.099	10	0.694	1	0.714	1	0.938	1	1.000	1
371 Iron / steel	0.022	45	0.263	4	0.125	8	0.158	6	0.600	2	0.500	2	0.382	3
372 Non-ferrous metals	0.031	32	0.116	9	0.000	-	0.000	-	0.714	1	1.000	1	0.294	3
381 Fabricated metals	0.006	173	0.329	3	0.005	195	0.000	-	0.543	2	0.370	3	1.000	1
382 Machinery	0.006	161	0.508	2	0.010	98	1.000	1	0.617	2	1.000	1	0.415	2
383 Electrical machinery	0.005	187	0.324	3	0.120	8	0.623	2	0.207	5	1.000	1	0.362	3
384 Transport equipment	0.014	72	0.191	5	0.053	19	0.641	2	1.000	1	0.571	2	0.300	3
385 Professional equipment	0.001	779	0.000	-	0.007	137	0.000	-	0.000	-	0.833	1	0.647	2
390 Other manufacturing	0.041	25	0.441	2	0.011	91	0.584	2	0.962	1	1.000	1	0.610	2

*Random Sampling from Commercial Industrial Data

Table G.08 Estimate of Overall Investment Demand

Enterprise	ISIC		Sampling		Expansion	Investment
			Specific	Random	Coefficient /I	Demand
I. Japan						
1	3121	Food	○		1	1
2	3211	Textile	○		1	1
3	3220	Apparel	○		1	1
4	3233	Leather products		○	14	14
5	3233	Leather products		○	14	14
6	3320	Furniture		○	37	37
7	3522	Other chemicals	○		1	1
8	3522	Other chemicals	○		1	1
9	3620	Glass & glass products	○		1	1
10	3813	Fabricated metals	○		1	1
11	3819	Fabricated metals		○	173	173
12	3823	Machinery	○		1	1
13	3823	Machinery	○		1	1
14	3829	Machinery	○		1	1
15	3831	Electrical machinery	○		1	1
16	3831	Electrical machinery	○		1	1
17	3831	Electrical machinery	○		1	1
18	3831	Electrical machinery	○		1	1
19	3832	Electrical machinery	○		1	1
20	3832	Electrical machinery	○		1	1
21	3832	Electrical machinery	○		1	1
22	3839	Electrical machinery	○		1	1
23	3839	Electrical machinery	○		1	1
24	3843	Transport equipment		○	72	72
25	3843	Transport equipment	○		1	1
26	3843	Transport equipment	○		1	1
27	3843	Transport equipment	○		1	1
28	3844	Transport equipment	○		1	1
29	3851	Professional equipment	○		1	1
30	3851	Professional equipment	○		1	1
31	3852	Professional equipment	○		1	1
32	3903	Other manufacturing		○	25	25
33	711	Others	○		1	1
Sub-Total						362
II. S. Korea						
1	3115	Food		○	3	3
2	3419	Paper		○	4	4
3	3513	Chemicals		○	1	1
4	3522	Other chemicals		○	9	9
5	3560	Plastic products		○	1	1
6	3720	Non-ferrous metals		○	9	9
7	3829	Machinery		○	2	2
Sub-Total						29
III. Singapore						
8	3211	Textile		○	1	1
Sub-Total						1
IV. Malaysia						
9	3819	Fabricated metals		○	3	3
10	3839	Electrical machinery		○	1	1
Sub-Total						4
V. Thailand						
11	3839	Electrical machinery		○	3	3
Sub-Total						3
TOTAL						399

Remark: /I Refer to Table G.07

APPENDIX-H

MASTER PLAN FOR INDUSTRIAL ESTATES DEVELOPMENT

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APPENDIX-H

MASTER PLAN FOR INDUSTRIAL ESTATES DEVELOPMENT

H.1 Framework of Industrial Estate Development

1) Necessity of Industrial Estates

In the Hanoi area, there are 9 major industrial areas with approximately 1,000 ha, as shown in Table H.01. The existing industrial areas, however, have been developed as industrial estates in the 1960s, and they are nowadays surrounded by the urbanized areas including housing and commercial facilities. The existing industrial areas could not be expanded, and some polluting industries are to be relocated to the suburbs.

Since the existing industrial areas are unable to be expanded, development of new industrial areas is necessary to meet the industrial investment demand in the Hanoi area. New industrial areas should be industrial estates designed to be exclusively utilized for the manufacturing industry. Environmental problems caused by mixed land use will be completely solved. The industrial estates will be fully equipped with infrastructures required for the promotion of investments and for the protection of the environment.

As discussed in Appendix-E.3, and indicated in Figure E.4, a conceptual plan has been formulated for the new industrial estates distribution in the Hanoi area. Four industrial estates: Thang Long North, Thang Long South, Dong Anh, and Gia Lam, have been selected as alternative industrial estate sites to be studied by JICA for development in the short term.

Advantages of the Four Industrial Estates

- a) These industrial estates are located close to the center of Hanoi urbanized area, and convenient for employees needed for the factory operation.
- b) Foreign developers are showing interest in developing these industrial estates.
- c) Main road access to these industrial estates is already developed. This is the marginal reason why these industrial estates could be developed in the short term.

In a longer term, the Route 5 and Route 18 corridors will play an important industrial role, and new industrial estates will be developed along these corridors for foreign and local investors. The Southwest area of Hanoi, including the Route 417 corridor where a new highway is planned to connect Hanoi with the Western Highlands, will also be suitable for new industrial estates to receive all types of industries. Even air polluting industries might be located there because of no adverse effect on Hanoi city since the southeast and northeast wind are dominant in the Hanoi area.

2) Demanded Area for Industrial Estates

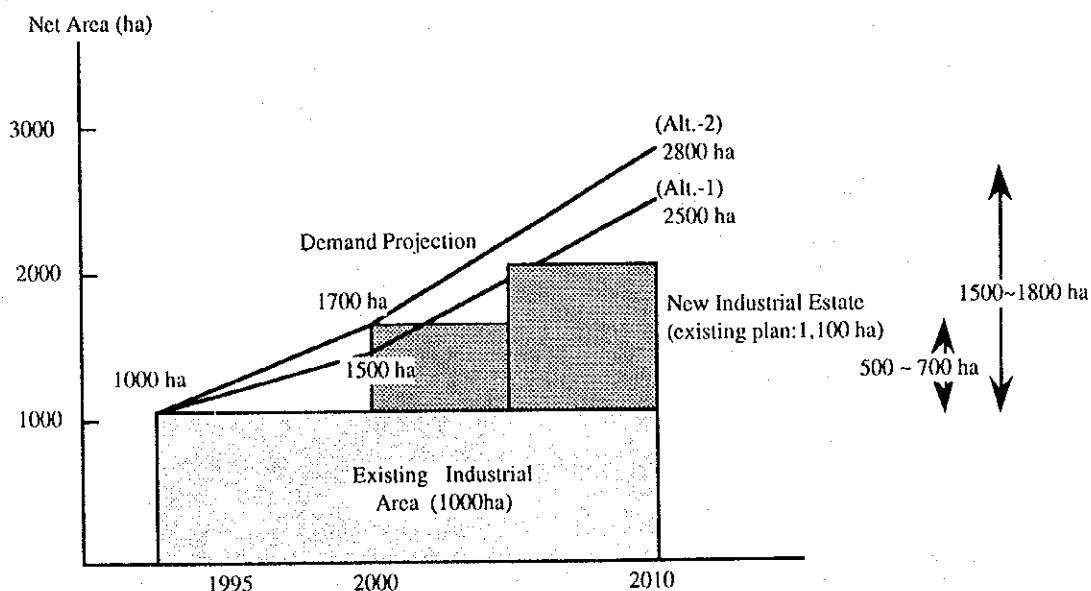
Four alternative industrial estate sites and one export processing zone have been identified and planned by the Urban Planning Institute (UPI), as shown below. Total industrial lands planned for the new industrial estates will amount to approximately 1,600 ha in gross or 1,100 ha in net. The distribution of alternative industrial estates is shown in Figure H.1.

		(Gross)	(Net)
1.	Thang Long North	280	197
2.	Thang Long South	220	164
3.	Dong Anh	92	68
4.	Gia Lam	438	276
5.	Soc Son (EPZ)	430	300
6.	Others		
	Taiwan IE	63	40
	Daewoo IE	80	55
	Total	1,603	1,100

According to the questionnaire survey conducted by the Study Team, as discussed in Appendix-G, the number of prospective investors in the industrial sector in the Hanoi area is currently estimated to be approximately 400 foreign enterprises.

For formulation of the industrial estate plan, it is proposed to conservatively expect that the demand for investments in the proposed industrial estates would be 200 to 400 firms. An area of 400 ~ 800 ha (average 600 ha) would be required as the net factory area demand by the year 2000, on the assumption that the average lot size is 2 ha per factory.

On the other hand, if the prospective annual growth rate of the industrial sector is around 15%, as expected by SPC to reach the level of industrialization in neighboring countries, the net area of industrial land in the Hanoi area is estimated to be increased by 500 ~ 700 ha by 2000, and 1,500 ~ 1,800 ha by 2010, as shown in Table H.02 and as illustrated below.



Under this prediction, development of some industrial estate sites with a total area of 500 ~ 700 ha will be required by the year 2000. This macro-economic estimate of demand is well coincident with the investment demand identified through the questionnaire survey.

3) Prospective Categories of Industries

The fabricated metal and machinery industry is the most favored in the Hanoi area, judging from the investment demand questionnaire survey by the Study Team. About 70% of expected manufacturing investors from Japan, and 40% from NIEs/ASEAN and Vietnamese investors are contemplating to invest in this field as shown below. Electric and transportation machinery are particularly favored by Japanese and local investors. The chemical industry including pharmaceuticals, plastics, and non-metallic mineral products such as pottery, tiles, and bricks are favored by local investors. Further details are shown in Table H.03.

Configuration of Industry - Prospective Investors by Category of Industry

(%)			
ISIC Category	Japan	NIEs/ASEAN	Local
31 Food, Beverage & Tobacco	3	9	6
32 Textile, Apparel & Leather	12	9	6
33 Wood & Wood Products	3	-	6
34 Paper Products	-	9	6
35 Chemical	6	27	6
36 Non-Material Mineral Products	3	-	20
37 Basic Metal Products	-	9	6
38 Fabricated Metal, Machinery	67	37	44
39 Others	3	-	-
71 Transport	3	-	-
Total	100	100	100

4) Establishment of a Cargo Distribution Center

The freight industry becomes more and more important as the level of the national economy is enhanced, as shown in Figure H.2.

In the study on industrial estate development at the proposed alternative sites, a plan of construction of a freight terminal for distribution of cargoes (Cargo Distribution Center) has been studied. In this plan, the transportation network on the northern corridor has been examined, within the framework of overall network development in the Hanoi area, as shown in Figure H.3.

H.2 Conceptual Plan For Industrial Estate Development

1) Thang Long North Industrial Estate

Major settings for development

The Thang Long North IE will be located along the new freeway which links the center of Hanoi City and Noi Bai International Airport. The distance between the center of Hanoi City and Thang Long North site is approximately 10 km. The site has an area of approximately 280 ha, demarcated by the Red river to the south and existing small villages to the west and north.

Thang Long North is a cross point where the railroad, the third ring road, the new airport freeway, and Route 2 (connecting Hanoi City with the northwest mountainous area of Vietnam) meet. It is basically planned that Thang Long North will be developed not only as an industrial estate but also as a cargo distribution center. Factory worker housing could be developed utilizing the sizable land around the site.

Consequently, 3 functions are proposed for the development of the Thang Long North site as follows:

- (1) Industrial estate - large scale industrial estate
- (2) Cargo distribution center
- (3) Residential area

Industrial types

The airport-based industries that produce high value added goods, such as electronic products and precision machinery, would be a target category for industries in the Thang Long North IE. Other types of industries such as electrical machinery, transport machinery, and light industry products will also be considered. For reference, according to the questionnaire survey conducted by the Study Team, the following types of industries have been favored for the Thang Long North IE:

- Electronic parts (Japan)
- Electric machinery (Japan)
- Electric parts (Japan, Malaysia, Thailand, Vietnam)
- Car parts (Japan)

Cargo distribution center

A cargo distribution center will be constructed at the entrance to the inner city to screen freight vehicles so as to mitigate the traffic congestion in the city. Consignment and unpacking of containers will be executed in the cargo distribution center.

Residential area

A new residential area will be developed in the Van Tri lakeside area and in the vicinity of the industrial estate site for the workers of the industrial estate. (See Appendix-I, I.1)

Land use

A land use concept for the Thang Long North industrial estate is illustrated in Figure H.4, and the distribution of land use is summarized below.

		ha	(%)	Remarks
1.	Industrial Estate			
	Factory Lot	197	(70)	
	Roads	23	(8)	
	Utilities	21	(8)	
	Others	39	(14)	IE center, park, etc.
	(Sub-Total)	280	(100)	
2.	Cargo Distribution Center	50		
3.	Residential Area	50		
4.	Others	17		
5.	Total	397		

Land grading

The Thang Long North site is currently used for paddy fields. The site should be filled to improve the bearing capacity of the ground and for storm water drainage. Judging from the site reconnaissance, and drilling survey, land filling of 2 meters thick on average is required.

Transportation network

The road system in the industrial estate will consist of a circular main road connected to a loop-wise sub-main roads. It is planned that the Thang Long North site will have the following transportation facilities:

- Main, sub-main and collector roads.
- Improvement of regional roads.
- A traffic signal at the entrance on Route No.2.

Water supply

Maximum water demand in the Thang Long North site is estimated to be 33,000 m³/day, including industrial and domestic use. Wells and conveyance pipes will be constructed in the estate to intake the required volume of groundwater.

Purification facilities, planned to be located at the northern side of the estate, will produce water in sufficient quantity and meeting the standard drinking water qualities in Vietnam. Iron, manganese, and ammonium compounds levels, which are rather high in groundwater in this region, will be removed.

Sewerage

A daily maximum volume of about 33,000 m³ of waste water will be generated from the industrial estate, residential area, and cargo distribution center. Waste water will be collected by a system of concrete pipes embedded along the roads, separately from the rain water drainage system. Some relay pump stations are necessary to transfer sewer because of the topographical conditions in the area, although in principle, waste water will be collected by gravity.

Oxidation ditch process will be applied for the sewage treatment plant, since this process is deemed to be most durable for large fluctuations of sewer flow and the easiest to operate and maintain.

Waste water can be treated up to a BOD level of 40 mg/l which meets the effluent standards in Vietnam. Final treated waste water will be pumped into the Red River through an overhead pipeline.

Stormwater drainage

A storm water drainage system consisting of open channels will be provided for the whole area including the industrial estate, residential area, and cargo distribution center. Retention ponds are planned to prevent any harmful environmental influences on the surrounding water bodies.

The drainage facilities will be designed on the basis of a peak flow discharge to be calculated in accordance with the rainfall intensity formula established by the Ministry of Construction (MOC). Stormwater is planned to be drained into the existing drainage canal running across the estate.

Electric supply

Total power demand is estimated to be around 72 MW, including the residential area with 2,000 households.

Power to the Thang Long North site will be supplied from the Dong Anh 110 kV substation which is located 8 km away. A new 110 kV substation will be constructed in the industrial estate to distribute power to the industrial estate and residential area.

Telecommunications

The nearest Hanoi Posts and Telecoms (HPT) telephone exchange station is located at Dong Anh, 6 km from the Thang Long North site. In order to meet the telephone demand of the Thang Long North site, the HPT telephone exchange station at Dong Anh will have to be expanded and installation of a new remote optical line terminal equipment (OLTE) station is proposed for the estate. OLTE will be connected to the HPT telephone exchange station at Dong Anh by optical fiber cable.

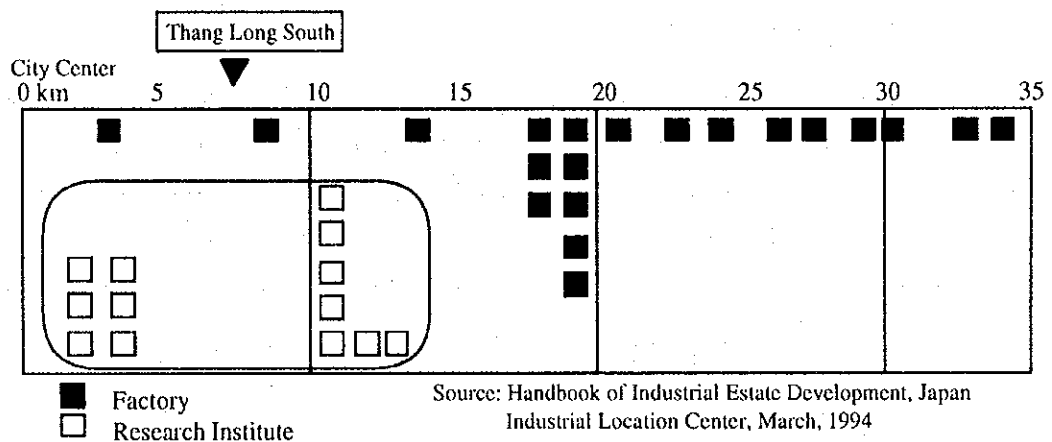
2) Thang Long South Industrial Estate

Major settings for development

The Thang Long South IE will be located in the north of Tu Liem district, the west suburban area of Hanoi city. The distance from the center of Hanoi City to the estate is approximately 8 km. The site is demarcated by the Nhue River to the east and the Red River to the north. The total area of the site as proposed by UPI is approximately 220 ha.

Since the Thang Long South IE will be located next to residential areas, introduction of clean manufacturing industries should be encouraged in order to avoid conflicts with the residential area.

A research and development industrial estate, research park or science park for instance, will be chosen for this alternative site. At present, there are some technical institutes in the vicinity of the proposed site. For reference, distribution of a research institute and factory can be planned in line with the model illustrated below. If this model is applied, the Thang Long South site is preferably developed as a research and development industrial estate.



In view of the above, the following types of industry are proposed for the Thang Long South IE:

- Science institute (public and/or private advanced technology research)
- Software company (computer software development, LSI design)
- Data processing (information service company)
- Design company (CAD, CG, etc. development)
- Precision machinery development company

Land use

The land use concept for the Thang Long South site is presented in Figure H.5. The proposed distribution of land use is summarized below.

	(ha)	(%)	Remarks
Industrial Estate			
(1) Institution/Factory lot	164	75	
(2) Road	22	10	
(3) Utility	18	8	
(4) Others	16	7	Park, IE center, etc.
Total	220	100	

Land grading

Like the Thang Long North site, the Thang Long South site is currently used for paddy fields and scattered with dry fields for vegetables cultivation. The site should be filled to improve the bearing capacity of the ground and to facilitate stormwater drainage.

Judging from the site reconnaissance, land filling of 2 meters thick on average is required. The fill volume is estimated to be 4.4 million m³ (development area 220 ha x thickness of fill 2.0 m). The planned retention ponds of 3.4 ha are not required to be filled.

Transportation network

The access road to the Thang Long South IE can be designed using two routes with a total length of 6 km: One is the main access connected to the Route No.2, and the other is a sub-access road to/from the south end of the Thang Long Bridge on the Route No.2. Since the site is located 3 km from the Route No.2, new bridges (spans of 70 m and 80 m) must be constructed on both the main and sub access roads.

Major transportation facilities in the Thang Long South site will include:

- | | | |
|--|---|-------------------|
| - Two access roads | : | Total 6.0 km |
| - Two new bridges on the access road | : | Spans 70 and 80 m |
| - Main, sub-main and collector roads | : | Total 8.6 km |
| - Traffic signal at the junction of Route No.2 and the access road | : | 1 set |

Water supply

Maximum water demand in the Thang Long South site is estimated to be 8,200 m³/day. Five wells of about 80 m in depth, including one backup well, and conveyance pipes of ductile cast iron will be constructed in the estate to intake the required volume of groundwater.

Purification facilities, located at the northern side of the estate and consisting of aeration and sand filtration process with chlorination, will produce water in sufficient quantity and meeting the standard drinking water qualities in Vietnam. Iron, manganese and ammonium compounds, which are high in groundwater around this region, will be removed by the purification facilities. Waste water generated from the purification is collected by a sewer system and treated by the waste water treatment facilities.

Sewerage

A daily maximum volume of about 8,200m³ of waste water will be generated in the estate. Waste water discharged from factories will be collected by a system of concrete pipes embedded along the roads, separately from the rain water drainage system. Some relay pump stations are planned to transfer sewer because of the topographical conditions in the estate, although in principle waste water will be collected by gravity.

In the event that waste water contains toxic substances or extremely high concentrations of organic matter, each factory is obligated to construct its own pre-treatment facilities sufficiently to maintain the designed performance of the centralized waste water treatment facilities.

Oxidation ditch process will be applied, since this process is deemed to be most durable for large fluctuations of sewer flow and easiest to operate and maintain. The waste water treatment facilities, located at the southern side of the estate, will be equipped with a sewer intake system, aeration rotors installed in oxidation ditches, settling basins, a disinfection system, and natural sludge drying beds.

Waste water can be treated up to a BOD level of 40 mg/l which meets the effluent standards in Vietnam. Final treated waste water will be lead to the Pheo River through open canals to be constructed for treated waste water and stormwater discharge.

Storm water drainage

The whole area of about 220 ha of the estate will be covered by a stormwater drainage system consisting of an open channel. Retention ponds with a total area of 3.4 ha are also planned to prevent any harmful environmental influences on the surrounding water bodies.

The drainage facilities will be designed on the basis of a peak flow discharge to be calculated in accordance with the rainfall intensity formula established by MOC. Rainfall with 5-year and 10-year return periods will be applied in the design of the drainage route and retention ponds, respectively. Stormwater will be drained into the Pheo River through open canals to be constructed.

Electricity supply

Power demand in the Thang Long South industrial estate is estimated to be around 33 MW. Power will be supplied to the estate from the Chem 220 kV grid substation located adjacent to the site. The existing 110/35/10 kV, 25 MVA transformer in the substation will be expanded to 50 MVA with two units (25 MVA x 2) of 110/22 kV. New double circuit 22 kV sub-transmission lines are recommended to be constructed from the Chem grid substation to the industrial estate. A switching station is also proposed to be constructed to receive power in the estate. 20 kV overhead distribution lines will be designed to feed electric power.

Telecommunications

Demand for telecommunications is estimated to be about 800 lines. The HPT Thang Long South telephone exchange station is located 3 km from the site, and has a capacity of 1000 lines. In view of the telecommunication demand, a new remote OLTE station will be installed on the estate and be connected to the Thang Long South

telephone exchange station by optical fiber cable. For distribution to subscribers, an underground metallic cable system will be built from the OLTE station. It is proposed by HPT that the cost of the design and construction/expansion work for telecommunication will be borne by HPT.

3) Dong Anh Industrial Estate

Major settings for development

The Dong Anh IE will be located in the existing Dong Anh industrial area, developed by the Vietnamese Government two decades ago. The site is at 20 km to the north of the center of Hanoi city. It takes 30 minutes to reach the site by the Route 3. The available land is limited to 92 ha due to the existing factories, warehouses, and villages. There are 22 existing factories, mainly state-owned enterprises engaging in transportation machinery, metal products, carpet weaving, printing, tile and bricks, etc. with a total factory area of approximately 68 ha.

The Dong Anh industrial estate plan calls for renewal and rehabilitation of the existing factories. Factories presently located in the center of Hanoi city and suggested to be relocated due to environmental and other problems and/or for more effective utilization of the urbanized inner city, will be relocated to the Dong Anh industrial estate. A foundry center, a metalworking center with centralized manufacturing equipment including steam and boiled water supply, and a toxic waste treatment facility, will support the renewal and rehabilitation of the metalworking factories.

For the existing factories, infrastructure facilities such as access road, water supply, sewerage, and drainage systems will be provided through implementation of this industrial estates.

Consequently, two schemes are proposed for the development of the Dong Anh industrial area:

- a) Development of the Dong Anh IE (92 ha)
- b) Infrastructure improvement for the Dong Anh industrial area
(existing 22 factories with 68 ha (net) and 33 warehouses, etc.).

Land use

The land use concept for the Dong Anh IE is presented in Figure H.6 and the distribution of land use is summarized below.

	(ha)	(%)	Remarks
Industrial Estate			
(1) Factory lot	68	73	inclusive of industrial center
(2) Road	7	8	
(3) Utility	10	11	
(4) Others	7	8	Park, etc.
Total	92	100	

The improvement plan for the existing Dong Anh industrial area is explained in the development plan for the transportation network and utilities.

Land grading

The present land is flat and paddy fields are scattered among the existing factory lands. The land should be reclaimed up to the level of the existing industrial area to facilitate drainage of stormwater and to improve the bearing capacity of the factory site.

Land filling is designed to utilize the soil excavated from retention ponds and a new drainage canal within/nearby the site. However, most of the filling materials should be obtained from the Red River or other borrow pits in the vicinity. The fill volume for the Dong Anh site is assumed as follows:

Total fill volume :	460,000 m ³
(development area 92 ha x thickness of fill 0.5 m)	
Soil from excavation for infrastructure :	30,000 m ³
<u>Soil from borrow pit :</u>	<u>430,000 m³</u>
Total	460,000 m ³

Transportation network

Existing industries in the Dong Anh site are mostly heavy industries such as automobile, brick, coal, construction materials, etc. The volume of bulky cargoes will further increase after the establishment of the new IE.

The traffic system in Dong Anh should take into account freight transport, as well as traffic from communities in the vicinity of the IE.

A 1.6 km long access road from the Route No.3 is proposed to be constructed for the estate. Besides, railway improvement to serve the estate should be considered in a long term program, since railway will play an important role in the transport of large and bulky cargoes.

Major transportation facilities to be developed for the Dong Anh IE are as follows:

- | | |
|---|-----------------|
| - Access road: | Distance 1.6 km |
| - Main, sub-main and collector roads: | Total 10.1 km |
| - Traffic signal at the junction of Route No.3 and the access road: | 1 set |

Water supply

Maximum water demand in the Dong Anh IE is estimated to be 13,300 m³/day for the newly developed area of 92 ha and the existing industrial land of 125 ha. Seven wells of about 80 m in depth, including one provisional well, and conveyance pipes of ductile cast iron are proposed to be constructed in the estate to intake the required volume of underground water.

A new water purification plant with a capacity of 14,000 m³/day will be installed in the Dong Anh IE, since it is too costly to rehabilitate the old facilities. The existing facilities of 4,000 m³/day will be demolished after the new plant is completed. The existing distribution pipelines will be used by connecting them with the new purification facilities.

Purification facilities, located at the northern side of the estate and consisting of aeration and sand filtration process with chlorination, will produce water in sufficient quantity and meeting the standard drinking water qualities in Vietnam. Iron, manganese and ammonium compounds, which are high in groundwater around this region, will be removed by the purification facilities. Waste water generated from the purification is collected by a sewer system and treated by the waste water treatment facilities.

Sewerage

A daily maximum volume of about 14,000m³ of waste water will be generated from the new industrial estate. Waste water discharged from factories will be collected by a system of embedded concrete pipes, separately from the rain water drainage system. Some relay pump stations are planned because of the topographical conditions of the estate, although in principle waste water will be collected by gravity.

In the event that waste water contains toxic substances or extremely high concentrations of organic matter, each factory is obligated to construct its own pre-treatment facilities sufficiently to maintain the designed performance of the centralized waste water treatment facilities.

Oxidation ditch process will be applied, since this process is deemed to be most durable for large fluctuations of sewer flow and easiest to operate and maintain. The waste water treatment facilities, located at the northern side of the estate will be equipped with sewer intake system, aeration rotors installed in oxidation ditches, settling basins, a disinfection system, and natural sludge drying beds.

Waste water can be treated up to a BOD level of 40 mg/l which meets the effluent standards in Vietnam. Final treated waste water will be led to the Calo River through open canals extended for stormwater discharge.

Stormwater drainage

The whole area of about 217 ha of the estate, including the existing industries, will be covered by a storm water drainage system consisting of open channels. Retention ponds of 1.5 ha in total area are also planned to prevent any harmful environmental influences on the surrounding water bodies.

The drainage facilities will be designed on the basis of a peak flow discharge to be calculated in accordance with the rainfall intensity formula established by the MOC. Rainfall with 5-year and 10-year return periods will be applied in the design of the drainage route and retention ponds, respectively.

Stormwater will be drained into the Calo River through an open canal currently used for drainage of agricultural land, after improving the downstream conveyance capacity in and outside the estate area.

Electric supply

Electric power for the existing industrial area is supplied from the Dong Anh 110 kV substation by 35/6 kV distribution lines.

Power demand for the new industrial estate (92 ha) is estimated to be around 20 MW. A single circuit 110 kV transmission line (AC - 120), which links the Dong Anh substation with the Go Dam substation, is running along the estate. However, the capacity of this line will not be sufficient to cover the required power demand, therefore, it is proposed to construct another 110 kV transmission line. A new 110 kV substation and 22 kV overhead distribution line will also be required for distribution of electric power.

Telecommunications

The estate site will be connected with the HPT Dong Anh exchange station. Telecommunication demand is estimated to be about 300 lines.

In view of this demand, a new remote OLTE station will be installed in the estate and connected to the exchange station at Dong Anh by optical fiber cable. For distribution to subscribers, an underground metallic cable system will be designed for the OLTE station. The cost for the construction and expansion work will be borne by HPT.

4) Gia Lam Industrial Estate

Major settings for development

Gia Lam has the most advantageous transportation facilities owing to the Route 5 which links Hanoi and Hai Phong, the third Hanoi City ring road, and the Hanoi-Hai Phong railroad. South Korean and Taiwanese investors have already invested in the development of 2 factory complexes with areas of 80 ha and 63 ha, respectively.

Development of a new industrial estate is proposed in Gia Lam under the development plan prepared by UPI. The proposed infrastructure is planned to serve not only the factories in the IE but also the neighboring Gia Lam community. A ring road and an electric power system are main items to be developed for the Gia Lam community.

Gia Lam is considered to be an important location for the development of a distribution / trading center in view of the concentration of transportation facilities at the site. Because heavy container cargo traffic has drastically increased by 60% per annum in Hai Phong port and that more than 90% of containers are transported by truck to Hanoi, the consignment and unpacking of containers is planned to be executed in the proposed distribution and trucking center in order to screen trucks before they enter the urbanized area of Hanoi city.

The Gia Lam IE, which is expedient for the transport of materials and products from/to Hai Phong port via the Route 5, is suitable for metal and machinery industries. Other types of industry which do not cause air pollution including plastic chemicals, food, wood furniture, and ceramics, are also suitable for the Gia Lam IE.

Air polluting industries should be prohibited, because Gia Lam is located in the direction of wind to the center of Hanoi city.

Consequently, the following types of industries are proposed for the Gia Lam IE:

(Most promising types)

- Metal products
- Electric machinery
- Electric parts
- Transportation parts
- Precision machinery

(Promising types)

- Food/beverage
- Pharmaceutical products
- Wood furniture
- Leather products
- Glassware/kitchenware

- Plastic products
- Cloth dyeing and coating

Land use

The land use concept for the Gia Lam IE is illustrated in Figure H.7 and the distribution of land use is shown below.

	(Ha)	(%)	Remarks
1. Industrial estate:			
Factory lot	277	(63)	
Roads	52	(12)	
Utilities	51	(12)	
Others	58	(13)	Park, drainage canal, etc.
(Sub-Total)	438	(100)	
2. Cargo distribution center	90		
3. Others	149		Interchange, ring road, sewerage, etc.
Total	677		

Land grading

The land is flat and basically cultivated with paddy. It should be filled up to the level of the existing road (about 1.5 meter above ground level) to drain stormwater and to improve the soil bearing capacity.

Transportation network

The on-going improvement of the Route No.5, together with the reconstruction of bridges at Phu Luong (across Thai Binh River) and Lai Vu (across Kinh Thai River), will reinforce the Hanoi - Hai Phong cargo traffic corridor. In the future, an additional freeway along the Ha Noi - Hai Phong corridor and completion of the Ha Noi ring roads will be recommended.

The Gia Lam IE is located between the proposed Third Ring Road and Route No.5 on the east bank of the Red River. This estate has easy access to Hai Phong port via Route No.5. Further, there is a proposal to develop a port at Cai Lan. Most of the cargoes through this port would be destined for Hanoi City. Therefore, it is strongly recommended that a flyover interchange be constructed at the crossing point of the Route 5 and the Third Ring Road to meet future traffic demand. Construction of the

proposed interchange will not only improve the traffic flow but also encourage the development of the industrial estate. It is also proposed to construct a cargo distribution center as an inland freight depot in the vicinity of the proposed interchange. Consequently, major transportation facilities proposed for the Gia Lam IE are as follows:

- 3rd Ring Road between the Route No.1 and No.5
- Interchange at the junction of the Route No.5 and the 3rd Ring Road
- Main, sub-main and collector roads
- Traffic signals at the 3rd Ring Road and Route No.5 where necessitated by demand.
- Reconstruction of the bridge at the Route No.5 across the Cau Bay River
(The existing bridge is insufficient for the future demand for stormwater drainage.)

Water supply

Maximum water demand in the Gia Lam IE, including the cargo distribution center of 90 ha, is estimated to be 46,000m³/day, excluding the water to be used for the 63 ha Taiwanese industrial estate*. Wells and conveyance pipes will be constructed in the estate to intake the required volume of groundwater.

* The Taiwanese Industrial Estate will construct its own water supply and sewerage systems.

Purification facilities, planned to be located at the northern side of the estate, will produce water in sufficient quantity and meeting the standard drinking water qualities in Vietnam. Iron, manganese and ammonium compounds, which are high in groundwater around this region, will be removed at the purification facilities.

Sewerage

A daily maximum volume of about 46,000m³ of waste water is considered to be generated in the estate, excluding the Taiwanese IE. Waste water discharged from factories is collected by a sewer collection system consisting of concrete pipes embedded along the roads, separately from the rain water drainage system. Some relay pump stations are planned because of the topographical conditions of the estate, although in principle waste water will be collected by gravity.

Oxidation ditch process will be applied for the sewage treatment plant, since this process is deemed to be most durable for large fluctuations of sewer flow and easiest to operate and maintain. Waste water can be treated up to a BOD level of 40 mg/l which meets the effluent standards in Vietnam. Final treated waste water will be discharged into the Cau Bay River through an open canal to be constructed along the estate.

Storm water drainage

The whole area of the Gia Lam IE, including the cargo distribution center but excluding the Taiwanese IE will be covered by a stormwater an open channel drainage system.

Retention ponds are also planned in order to prevent any harmful environmental influences on the surrounding water bodies as a result of the industrial estate development. The drainage facilities will be designed on the basis of a peak flow discharge to be calculated in accordance with the rainfall intensity formula established by the MOC.

Stormwater will be drained into the Cau Bay River through an open canal to be constructed along the estate.

Electric supply

Total power demand in the Gia Lam IE is estimated to be around 300 MW including the new industrial estate and Gia Lam community. The 110 kV Gia Lam substation with a capacity of 25 MVA exists at a distance of 0.5 km from the northern corner of the estate. The capacity of this substation is planned to be expanded by 80 MVA (2 x 40 MVA).

Power supply to Gia Lam estate will be first made from the existing Gia Lam substation. Thereafter, expansion of the existing substation, and construction of a new substation will be required.

Telecommunications

The existing HPT Gia Lam telephone exchange station is located 1.5 km from the proposed industrial estate. To meet the demand of the Gia Lam IE, a new remote OLTE station will be installed in this site. The OLTE station will be connected with the HPT Gia Lam telephone exchange station by optical fiber cable.

H.3 Initial Environmental Examination

1) General Environmental Issues

To prevent, control and mitigate environmental problems eventually caused by industries, establishment of industrial estates in and around the Hanoi area is indispensable. Industrial estates are able to utilize common facilities for water supply, waste water treatment, and solid waste disposal. It is also possible to minimize transportation needs and traffic problems.

Environmental aspects should be considered when selecting the location of industrial estates and the types of industries. Also, pollution prevention is much more cost effective than remedying environmental damage.

An Environmental Protection Law was enacted in December 1993 and a Government Decree on Environmental Protection in October 1994. In addition, there are other laws and standards, which should be referred to in selecting the location of industries and the method of discharging all kinds of industrial wastes. Owing to these Law and Government Decree, environmental management is improving and an Environmental Impact Assessment has been specified to be compulsory for certain types and sizes of industries. This legislation makes it possible to select suitable factories and to prevent construction of hazardous or outmoded factories.

2) Initial Environmental Examination at Alternative Estate Sites

(1) Thang Long North Industrial Estate

Location and Present Use

The proposed area is located next to the Thang Long Bridge and highway, and in the immediate vicinity of the Red River embankment. The land consists mostly of paddy fields, and there are no villages. There is a cemetery in the middle, which has to be taken into consideration. There are also irrigation channels, which have to be retained or re-arranged to continue irrigation and drainage of the remaining agriculture area.

Environmental Impact

The proposed industrial estate would have no serious negative environmental impacts on the area, as it is located near the main highway and bridge which had already affected the area with traffic and construction works.

The estate's location in close proximity to the Red River has to be considered to prevent any further pollution. However, it is possible to discharge treated waste water into the Red River, because the dilution capacity of the river is quite large. The selection of possible factories has to be done carefully, to avoid any hazardous pollution. Construction works cannot be carried out near to the embankment. The wind direction is suitable in relation to the urban area in Hanoi.

The present irrigation canals are used for irrigation and drainage, and the direction of flow can be changed according to demand. The flow in these channels may be low, and therefore treated waste water cannot be discharged into the canals.

(2) Thang Long South Industrial Estate

Location and Present Use

The proposed area is located in the immediate vicinity of the Red River embankment. The area consists mostly of paddy fields, but power transmission lines are scattered in the area. There are also villages engaged in bamboo selling and small industries of construction materials around the site.

Environmental Impact

The proposed industrial area is relatively small, being limited by two transmission lines that limit the area. Its location in close proximity to villages and the Red River embankment also limits the use of this area. There are no main roads near the area, therefore transportation has to be carefully planned. The pollution of irrigation canals and groundwater has to be prevented, because the area is located upstream and north of the city. The prevailing wind direction is deemed to be suitable.

(3) Dong Anh Industrial Estate

Location and Present Use

The proposed area is located 20 km north of the city. There are old and new industries scattered between villages and paddy fields. A small cemetery exists in the site.

Environmental Impact

The Dong Anh IE will be small in scale and the works will mainly include rehabilitation of existing industries and development of a new industrial estate to accommodate the existing factories to be relocated from the center of Hanoi city. So,

the impact of the estate development on the neighboring environment is projected to be mild.

Some adverse impacts, however, such as the relocation or reserve of the cemetery and traffic problems due to the poor condition of roads, should be mitigated. There are no major rivers or channels next to the proposed area, but the pollution of groundwater has to be prevented.

(4) Gia Lam Industrial Estate

Location and Present Use

The proposed area is located on the east side of the Red River, and near the Route No. 5. Foreign and local industries have been already established near the proposed area. There is also Gia Lam Airport to the west of the industrial estate. The proposed area consists of fields surrounded by villages, factories, and small forests. There are also trees along irrigation canals in the middle of the fields.

Environmental Impact

The Gia Lam area is already built up, and as residents are basically used to noise from factories and traffic, environmental impacts will be quite limited. Transportation conditions are good, and a proposed cargo distribution center would decrease heavy traffic in the city, therefore mitigating traffic problems.

The main wind direction is from the northeast to the city area, so heavily polluting industries cannot be located in this area.

The Red River, Duong River, and some irrigation canals are located near the area. The discharge of treated waste water has to be so planned as to cause the least impact on the rivers. The pollution of groundwater also has to be prevented.

3) Priority of Proposed Industrial Estates from Environmental Viewpoint

As the construction of the proposed industrial estates differs substantially from the old days in Vietnam, it is better to locate them near main roads and the city, where original village-structures have already changed. These areas also facilitate the building of infrastructure, and prevention and control of pollution.

It has been proposed that the Thang Long North and Gia Lam IEs be implemented in the first stage, and the Thang Long South and Dong Anh IEs in the later stage. This proposed plan is suitable from the viewpoint of environmental and socio-

economical conditions. The rating of the proposed areas according to their environmental impact may be: 1st: Thang Long North, 2nd: Gia Lam, 3rd: Dong Anh, and 4th: Thang Long South.

H.4 Development Schedule

1) Selection of Priority Sites for Development

In the preliminary evaluation of the 4 alternative industrial estate sites, the following evaluation criteria have been selected:

- (a) Preference of development: If the investment demand is supposed to be strong, the preference score is evaluated as high.
- (b) Easiness of development: Access from highway/inter city road to industrial estate is evaluated.
- (c) Development cost: Unit cost of land grading, roads, and utilities is evaluated on the unit cost basis. Internal and external costs are considered in the evaluation.
- (d) Environmental impact (natural, social): Water contamination and wind direction affecting the natural environment and socio environment impacts on the existing residents/communities are examined.

In accordance with these criteria, each alternative estate site has been evaluated as summarized below.

Alternative I/E site	Net Area (ha)	Preference of Development	Ease of Development	Unit Development Cost (%)	Environmental Impact		Overall Rating
					Natural	Social	
1. Thang Long North	197	O	OO 5/	O (100)	O	O	excellent
2. Thang Long South	164	O	Δ 3/	O (100)	Δ	O	good
3. Dong Anh	68	OO 1/	Δ 4/	Δ (150) 2/	O	Δ	good
4. Gia Lam	277	OO 2/	OO 6/	Δ (140) 7/	Δ	O	excellent

Remarks:

- 1/ The Dong Anh IE is preferred because of the requirement to renew and resettle of local factories located in the center of Hanoi city.
- 2/ The Gia Lam IE is most preferred because of the development potential in the Gia Lam area.
- 3/ A long access road should be built between the airport highway and the IE site.
- 4/ An access road is necessary for the development of Dong Anh IE.
- 5/ Direct access to the Thang Long North IE from the airport highway is possible.
- 6/ Direct access to the Gia Lam IE from the third ring road is possible.
- 7/ Development cost of the Gia Lam and Dong Anh IEs is high due to the construction cost of the external road.

The overall rating shows that the Thang Long North IE and the Gia Lam IE are preferable and will be developed in the first stage of implementation, up to the year 2000. The net area of about 500 ha to be developed for the Thang Long North IE (197 ha) and Gia Lam IE (277 ha) will be fully utilized by the investors whose land demand has been estimated to be around 600 ha based on the result of the questionnaire survey

as described in Chapter H.1.2) and Appendix-G. The deficit of 100 ha will be provided by the existing industrial estates such as Soc Son EPZ, Taiwanese estate in Gia Lam, etc.

As far as the Thang Long South IE is concerned, it is recommended that the development should be done in the latter stage so that the research and development industries have sufficient time for modernization and redevelopment.




2) Development Schedule

The Thang Long North and Gia Lam IEs are proposed to be developed in the first stage of implementation. In view of the fact that investment demand will increase gradually and the preceding estates and EPZs, such as the Soc Son EPZ, Taiwanese estates, etc., will absorb investors, it is proposed that the Thang Long North and Gia Lam IEs be developed by 2000, and the Dong Anh and Thang Long South IEs be developed after that.

Additional industrial estates could be conceived after 2000, in line with the infrastructure development, especially the new highway, and the future growth of the industrial sector, as discussed in Chapter H.1, Section 1). Additional estates could be located in the prospective lands along the Route 5 and the new highway Route 18, connecting Hanoi and Cai Lan new port.

A proposed schedule for industrial estates development in and around Hanoi is schematically shown below.

Year	1995	2000	2005	2010
1 Thang Long North IE	1st phase (150 ha)	(50 ha)		
2 Thang Long South IE			(150 ha)	
3 Dong Anh IE		(70 ha)		
4 Gia Lam IE	1st phase (200 ha)	(100 ha)		
5 Soc Son EPZ	1st phase (100 ha)	(200 ha)		
6 Taiwan IE	(40 ha)			
7 Daewoo IE	(55 ha)			
8 Other IE (R.18/R.5)			(150 ha)	(340 ha)
Total Area (ha)	(55 ha)	(640 ha)	(500 ha)	(500 ha)
	Total: 1,700 ha			

-  New industrial estate studied in the JICA Master Plan
-  Existing industrial estate
-  Conceivable new industrial estate along R.18 and R.5

H.5 Institutional Arrangements for Implementation

1) Initiatives for Industrial Estate Development

Various types of arrangements are conceivable for the implementation of the proposed industrial estates in the Hanoi area. Private development initiatives, governmental development initiatives and a combination of these two have been comparatively discussed as summarized in Table H.04.

A combined type of management is recommendable for the Hanoi area in the first stage implementation of the Thang Long North and Gia Lam IEs, judging primarily from the financial sources and organizational arrangements. The combined type is most preferable because the development body can receive proper assistance in land acquisition and land compensation from the Government. The Government, on the other hand, can control proper land development without environmental degradation.

2) Organizational Arrangements

Even if the combined type of management is adopted for the implementation of the Thang Long North and Gia Lam IEs, the establishment of a new organization to manage the industrial estate development should be envisaged at regional and national levels.

The Vietnamese Government is studying the restructuring of the central management system for industrial estate development. Three regional organizations under the central agency for industrial estate development have been conceived and discussed. In line with this concept, 2 alternative systems have been studied for the new organization arrangements.

As shown in Figure H.8, the Alternative-A (control type), is similar to the concept of central management currently studied by the Vietnamese authorities. This system has an advantage in the management of industrial estates and EPZs under the central Board of Management. However, it is less effective in the actual operation of the estates. The Alternative-B (practical type), is a system proposed to enhance the initiatives of the regional authorities, both in management and in operation. From the viewpoint of regional development, as well as in view of financial management of the estates and accumulation of skills and personnel, the Study Team is in the opinion that the Alternative-B is more practical and recommendable.

Strategic establishment of an industrial estate development organization in Vietnam is proposed by referring to the Alternative-B, as follows:

First Step (now)	: Develop new organizations, such as the <u>Land Development Corporations</u> under major local governments where foreign developers are showing interests in participating.
Second Step (~2000)	: A central land development organization like "Japan Regional Development Corporation" in Japan or IEAT in Thailand, would be organized in order to develop the industrial estates in undeveloped regions. A sort of regional development will be pursued by the central land development organization.
Third Step (2000~)	: Once the local manufacturing enterprises grow, the Land Development Corporations in major cities would be transformed to developers of local industrial estates.

The functions of the Hanoi Land Development Corporation (HLDC) proposed in the Alternative-B will be as follows:

- (a) HLDC is proposed to be newly organized and administered by HPC.
- (b) HLDC will manage the development of industrial estates exclusively in the Hanoi area.
- (c) HLDC will invest in the establishment of J/V industrial estate development companies in cooperation with foreign developers.
- (d) The J/V development company will execute the construction works of the estate and operate it.
- (e) HLDC is proposed to have following specific functions:
 - ensure one-stop service for foreign developers;
 - manage land development projects in the Hanoi area;
 - invest in J/V developing companies through equity participation;
 - accumulate experiences, skills, manpower, and financial power for subsequent projects.

On the other hand, development of the external infrastructure will be undertaken by the organizations concerned, such as the Ministry of Energy for installation of electric facilities, and the Ministry of Transportation and Communications for the construction of the Third Ring Road.

3) Development Procedures

In the event that organization arrangements are set up, the development procedures are preliminary conceived as illustrated hereunder.

Financing of the external infrastructure will depend on external loans on concessional terms. In view of the investment demand and the time required for construction, it is suggestible that financial arrangements be initiated as early as possible.

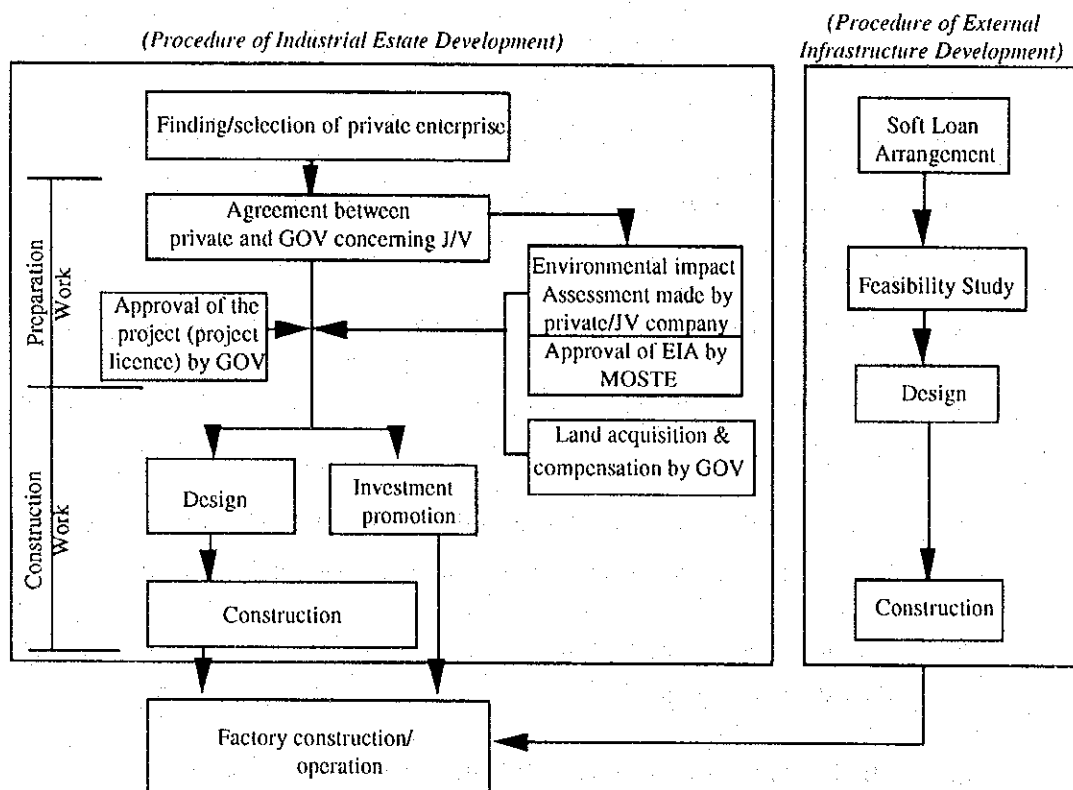


Table H.01 Major Industrial Area and Estimate of Factory Land Area in Hanoi

Major Industrial Area	1992			Principal type of industry
	Number of Enterprise	Factory Land Area (ha)	Number of Employee	
1 Minh Khai-Vinh Tuy	38	81	15,912	textile, machinery, construction materials
2 Truong Dinh-Giap Bat	13	32	3,764	food, machinery, glassware, wood products
Van Dien-Phap Van	14	39	5,895	chemical fertilizer, machinery, construction materials, pottery, wood products
4 Thong Dinh-Nguyen Trai	29	76	17,264	food, rubber, soap, tobacco, machinery, leather shoes, weaving, pottery, apparel
5 Cau Dien-Mai Dich	8	27	1,946	food chemical, construction materials, wood processing
6 Gia Lam-Yen Vien	21	38	10,227	machinery, wood products, chemical, oil refinery, pottery, food, leather shoes, apparel
7 Dong Anh	22	68	8,284	machinery, metal, construction materials, printing, food
8 Chem	5	14	2,309	construction materials, weaving, packing
9 Cau Buou	5	4	1,386	chemical, machinery, construction materials
Total	155	379	66,987	

Source: HPC

Estimate of Factory Area in Hanoi in 1992

- 1 Total employee: 140,300 persons in 1992 (Economic and Finance of Vietnam 1986 - 1992, General Statistic Office, 1994)
(State enterprise: 94,900)
(Non-state Enterprise: 45,400)
- 2 Unit employee per hectare:
Major industrial area: $66,987/379 = 180$ persons/ha
Whole industrial area in Hanoi: $180 \times 0.8 = 145$ persons/ha
- 3 Total factory area of Hanoi:
 $140,300/145 = 960$ ha (net)
 $960/0.7 = 1,370$ ha (gross)

Table H.02 Prospects of Gross Output, Number of Employees and Industrial Land Area
for the Manufacturing Industry Sector of Hanoi Area in 2000/2010

Item	<i>Present</i>					<i>Estimate /4</i>			
	1986	1989	1990	1991	1992	<i>Alternative 1</i>		<i>Alternative 2</i>	
						2000	2010	2000	2010
1 Gross Output (billion Dong) /1	928	1,056	1,060	1,046	1,168	3,990	19,420	4,120	19,910
2 Number of Employees (1,000)	278.7	234.4	210.2	146.1	140.3	199.0	317.0	238.0	395.0
3 Area of Industrial Land (ha) /2									
Net					960	1,540	2,470	1,740	2,750
Gross					1,370	2,200	3,530	2,490	3,930

<i>(increment)</i>											
Item	<i>Present</i>					<i>Estimate /4</i>					
	1986	1989	1990	1991	1992	<i>Alternative 1</i>			<i>Alternative 2</i>		
						1992-2000	2000-2010	1992-2010	1992-2000	2000-2010	1992-2010
1 Gross Output (billion Dong) /1	-	128	4	-14	122	2,822	15,430	18,252	2,952	15,790	18,742
2 Number of Employees (1,000)	-	-44	-24	-64	-6	59	118	177	98	157	255
3 Area of Industrial Land (ha)											
Net					960	580	930	1,510	780	1,010	1,790
Gross					1,370	830	1,330	2,160	1,120	1,440	2,560

Remarks : /1 at constant 1989 price

/2 cumulative number

/3 net area=gross area x 70 %

/4 Alternative 1 : In case of natural growth

Alternative 2 : In case of more industrial concentration in Hanoi, Haiphong and Hai Hung

Source: Present number of gross output and employee are based on the "Economic and Finance of Vietnam 1986-1992, General Statistical Office, 1994."

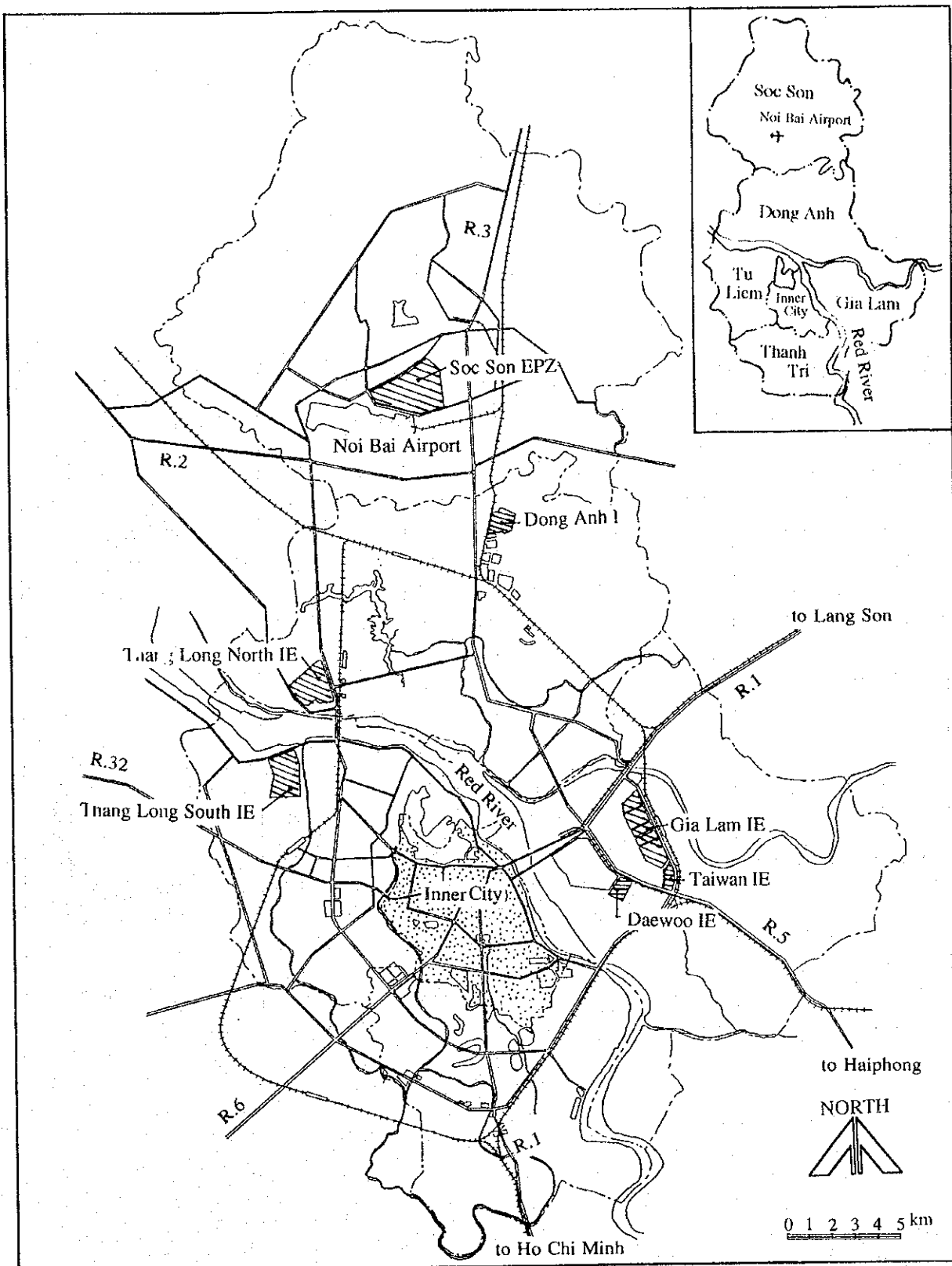
Table H.03 Prospective Type of Industries

ISIC	Category of Industry	Expected Investors			Percentage(%)		
		Japan	NIEs ASEAN	Vietnamese	Japan	NIEs/ ASEAN	Vietnam
31.	Food, Beverage and Tobacco	(1)	(1)	(1)	3	9	6
	311/312 Food	1	1	-			
	313 Beverage	-	-	1			
32.	Textile, Apparel & Leather	(4)	(1)	(1)	12	9	6
	321. Textile (produced textile goods)	1	1	-			
	322. Apparel	1	-	1			
	323. Leather products	2	-	-			
33.	Wood and Wood Products	(1)	(0)	(1)	3	-	6
	331. Wood products	-	-	-			
	332. Furniture	1	-	1			
34.	Paper Products	(0)	(1)	(1)	-	9	6
	341. Paper products	-	1	1			
	342. Printing	-	-	-			
35.	Chemicals	(2)	(3)	(1)	6	27	6
	351. Industrial chemicals	-	1	-			
	352. Other chemical/drugs	2	1	-			
	355. Rubber products	-	-	1			
	356. Plastic products	-	1	-			
36.	Non-metallic Mineral Products	(1)	(0)	(3)	3	-	20
	361. Pottery, earthenware	-	-	1			
	362. Glass	1	-	-			
	369. Tiles, bricks	-	-	2			
37.	Basic Metal Products	(0)	(1)	(1)	-	9	6
	372. Non-ferrous metals	-	1	1			
38.	Fabricated Metal, Machinery	(22)	(4)	(7)	67	37	44
	381. Fabricated metal	2	1	1			
	382. Machinery	3	1	-			
	383. Electric machinery	9	2	3			
	384. Transportation machinery	5	-	2			
	385. Precision machinery	3	-	1			
39.	Others	(1)	(0)	(0)	3	-	-
71.	Transport	(1)	-	-	3	-	-
Total		33	11	16	100	100	100

Source: Questionnaire Survey by the JICA Study Team

Table H.04 Implementation System

Item			Alternative			
			A	B	C	D
			Private Development	Combined Type I	Combined Type II	Governmental Development
Implementing Organization	Industrial Estate		Private	JV (Private + Government (HPC))	JV (Private + Foreign gov. agency + Government (HPC))	Government (Governmental Agency)
	External Infrastructure		Government (HPC, etc.)	Government (HPC, etc.)	Government (HPC, etc.)	Government (HPC, etc.)
Finance Source	Industrial Estate	Equity	100 % private	70 % private, 30% government	70 % private, 30% government	
		Dev. Cost	100 % private	100 % private	Private and external soft loan	External soft loan
Comparison	Advantage		External soft loan	External soft loan	External soft loan	External soft loan
			Governmental finance is unnecessary for the development of IE.	Government control is possible in development of IE.	Government control is possible in development of IE.	Government control is 100 % in development of IE.
				Project progress is rather rapid due to smooth land acquisition.	Project progress is rather rapid due to smooth land acquisition.	Project progress is rather rapid due to smooth land acquisition.
	Disadvantage				Finance source arrangement and investment promotion is rather easy due to the participation of foreign governmental agency.	
			Government control is difficult in dev. of IE.	Governmental finance is necessary for the equity.	Governmental finance is necessary for the equity.	Governmental finance is necessary for the equity.
			Project progress is slow due to the land acquisition problem.			Enhancement/establishment of the implementing organization in the government (HPC) is inevitable.
Example			Private IE in Indonesia, Jakarta	Thang Tuan EPZ	Dairen Industrial Estate, China	Some estates of Industrial Estate Authority of Thailand (in 1980s)
			Private IE in Manila, Philippines	Some estates of Industrial Estate Authority of Thailand (in 1990s)		Industrial Estates in Sri Lanka Kulimu High Tech Industrial Estate in Malaysia
Suitable System in Hanoi			O	OO	OO	O



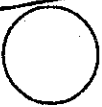
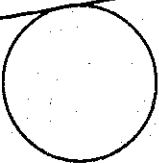
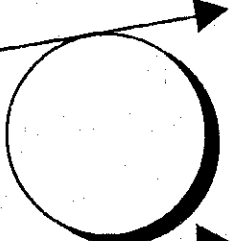
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IN THE HANOI AREA

Figure H.1
Distribution of Industrial Estate Alternatives

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	Low-income Economics	Middle-income Economics	High-income Economics
GDP per Capita	Less than \$1,300	\$1,300 ~ \$4,500	more than \$4,500
Principal Sector	Agriculture	Industry	Service
Intensiveness	Labor	Capital	Technology
Industrial Park (Distribution Center)	EPZ  Primary (small-scale)	EPZ I/E  Developing (medium-scale)	I/E  Well-generated (large-scale)

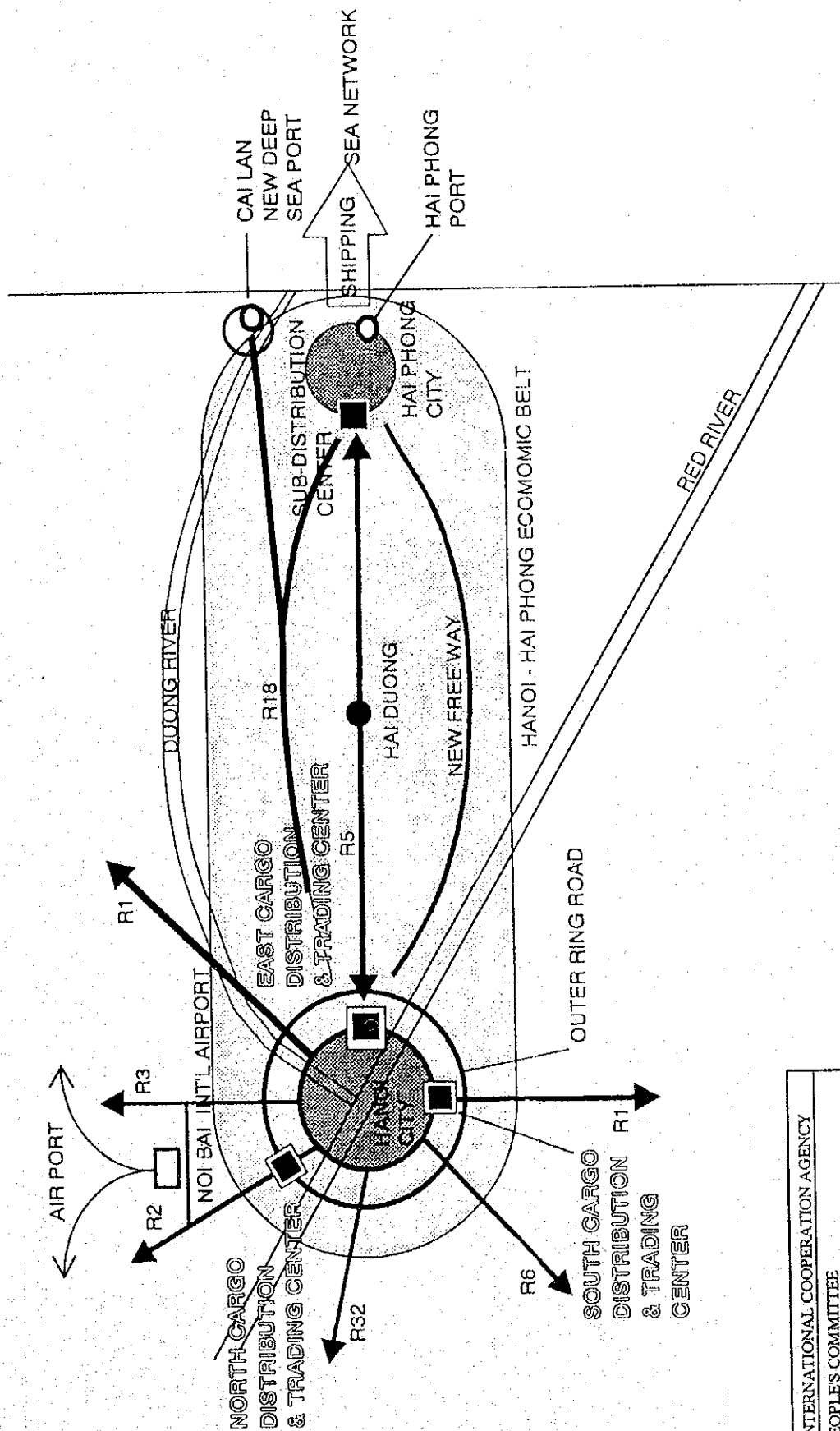
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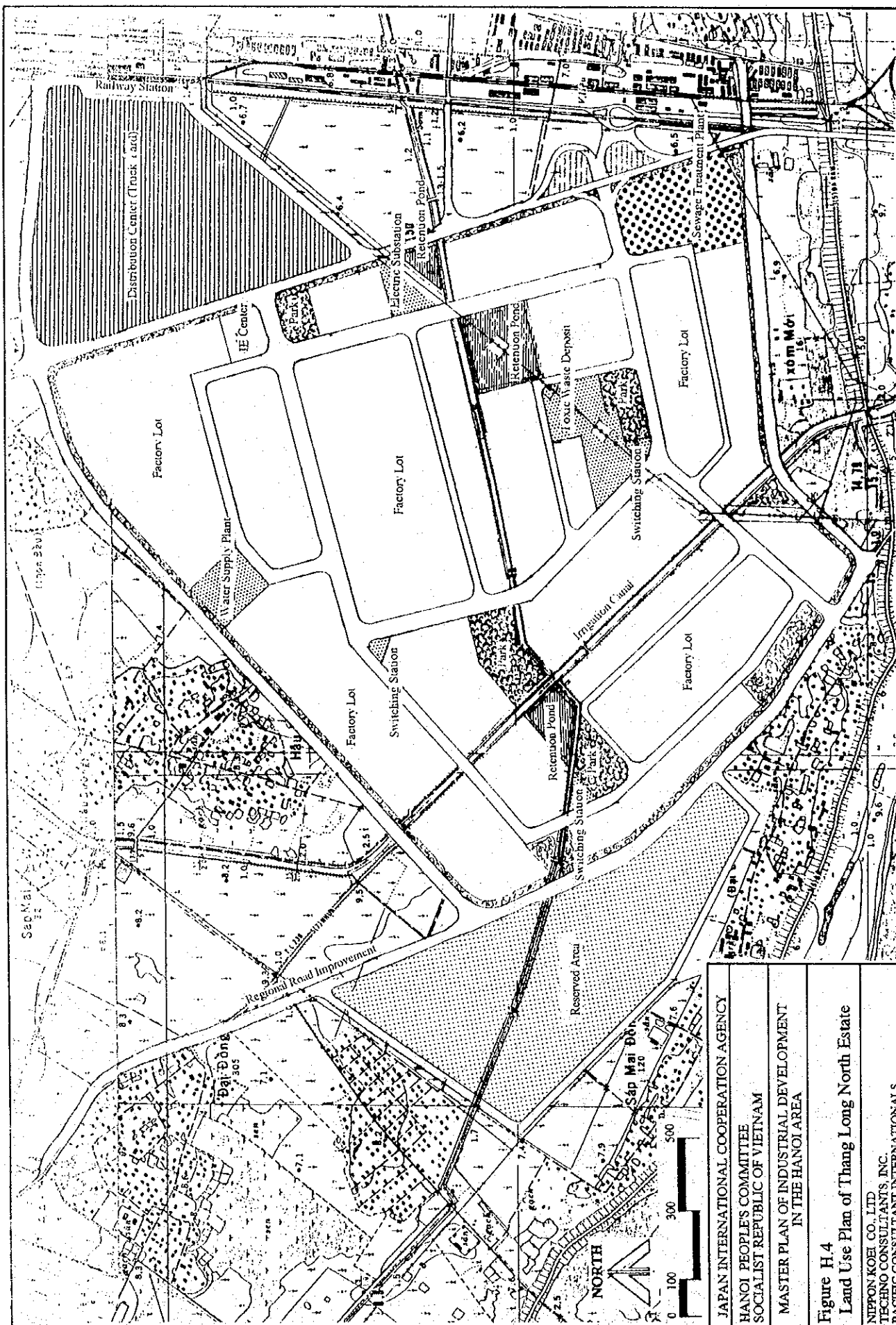
Figure H.2 Necessity and Function of Cargo
Distribution Center by Economic Level

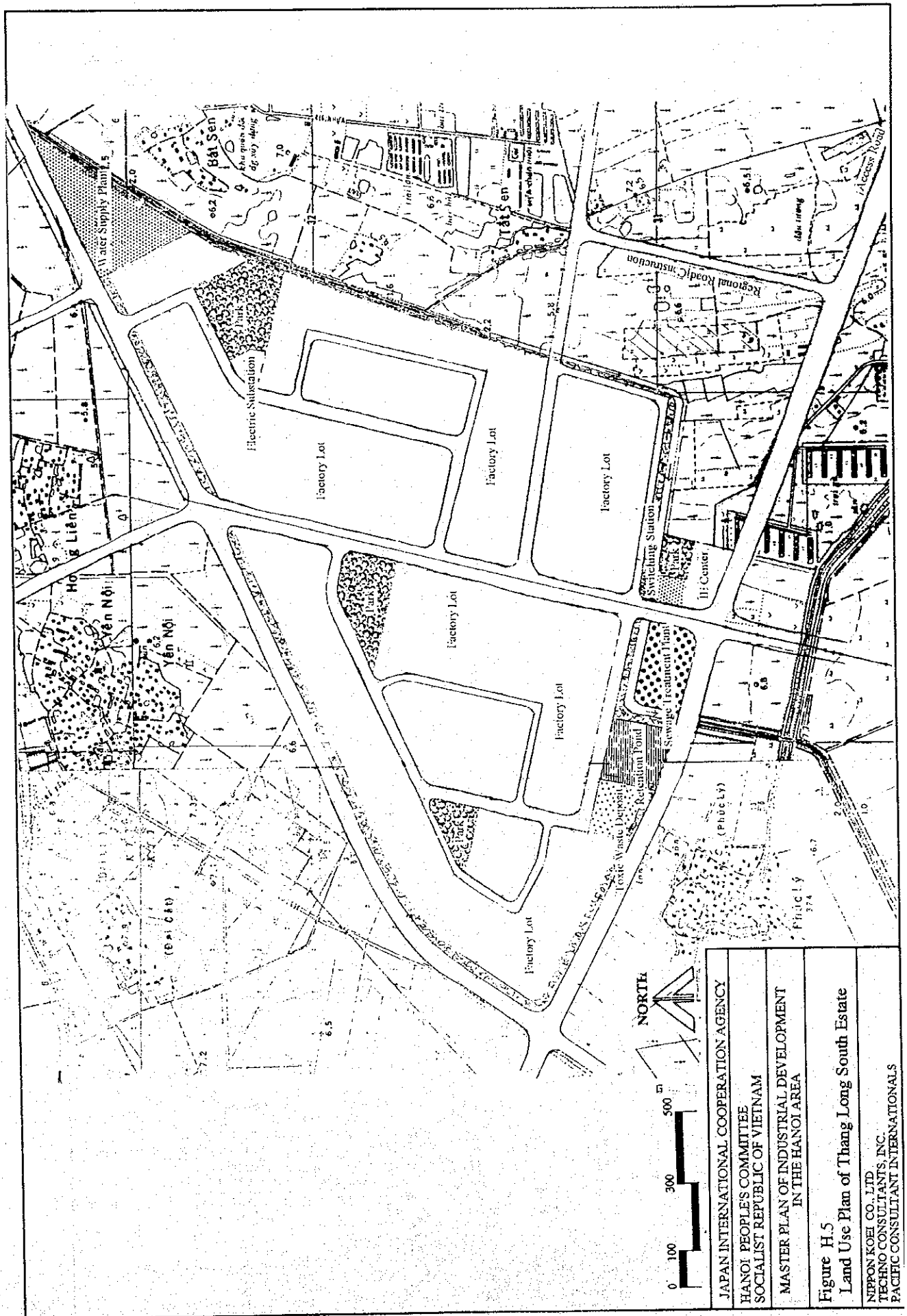
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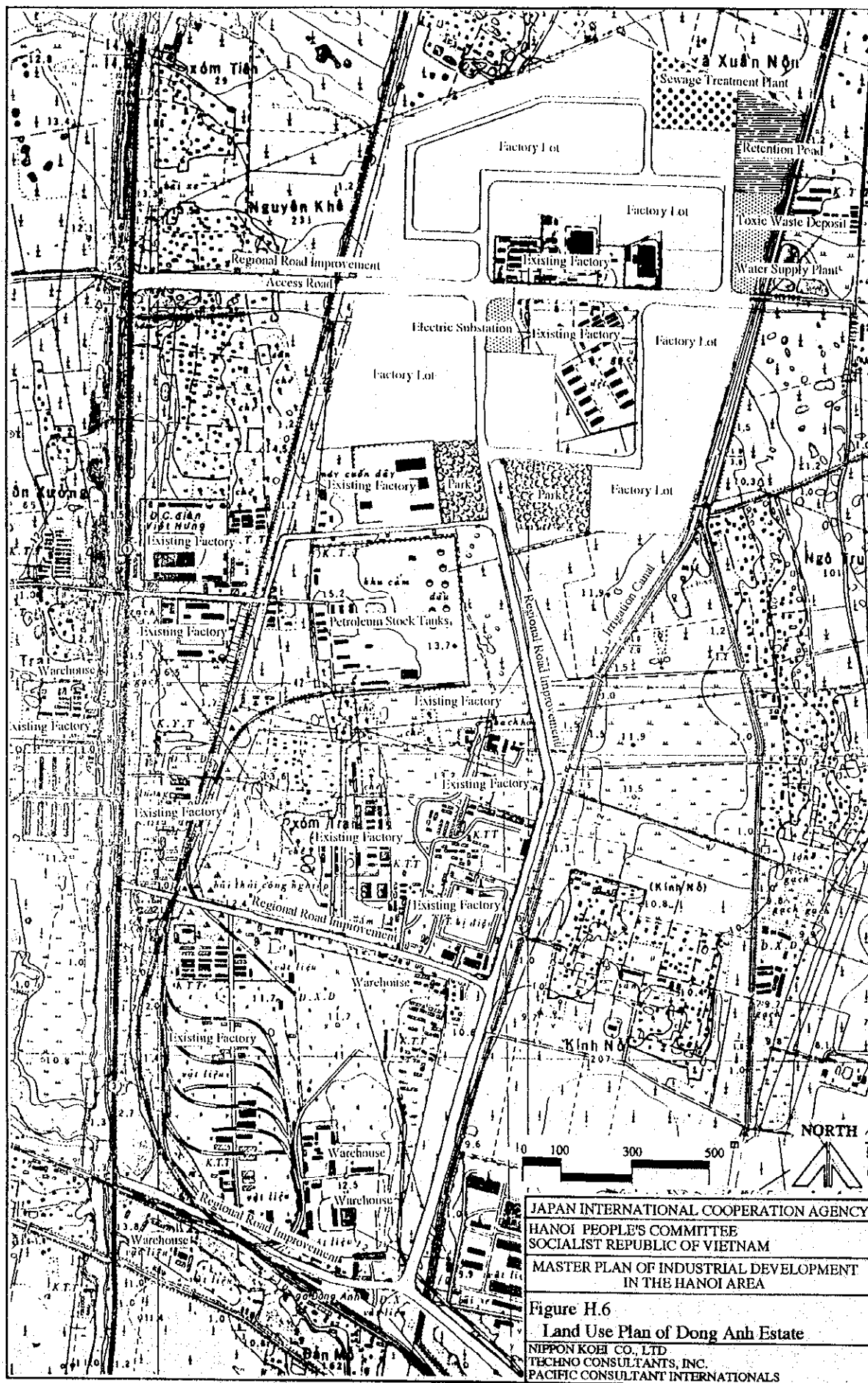


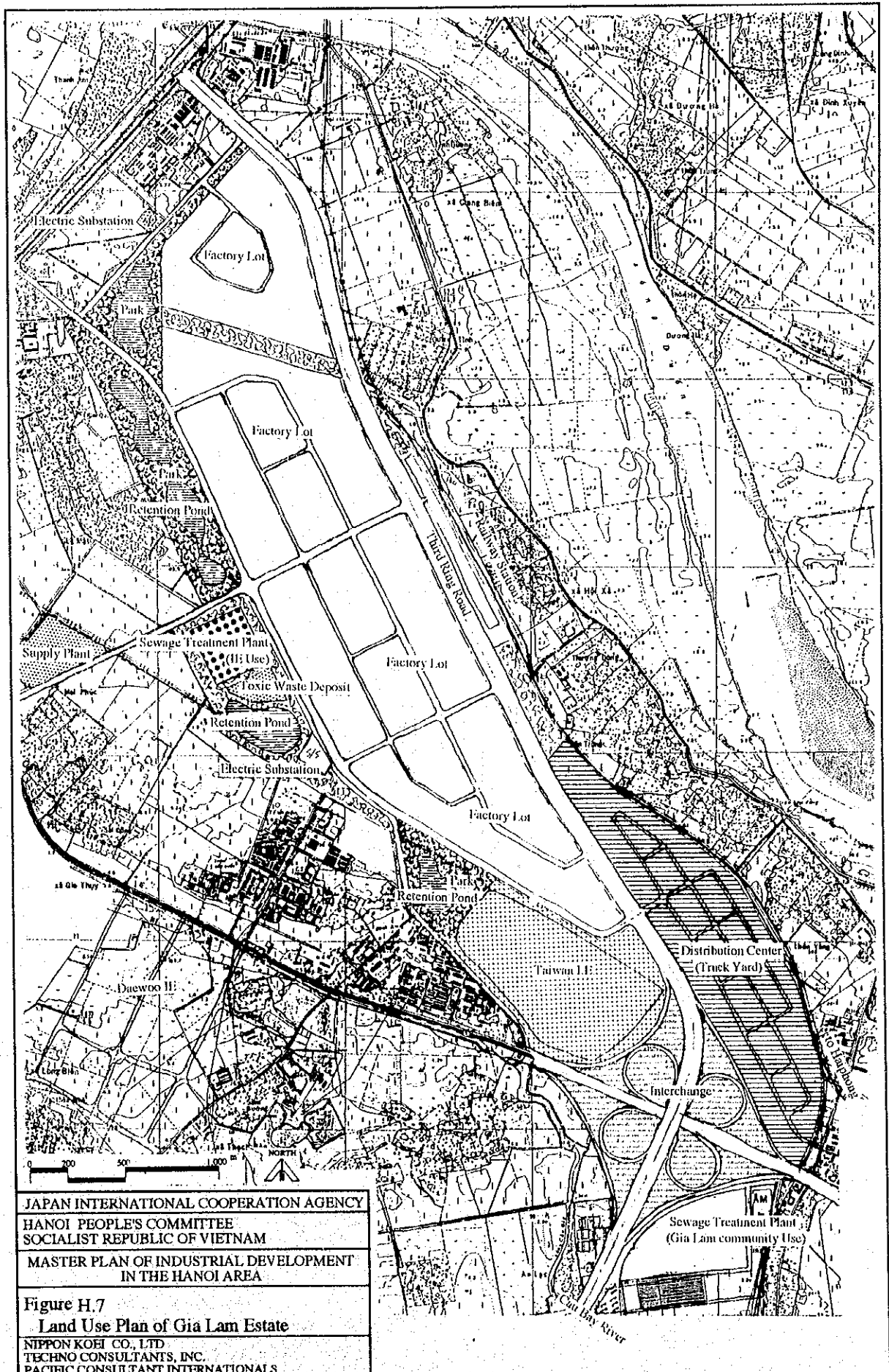
CONCEPT FOR CARGO DISTRIBUTION AND TRADING
CENTER ON THE RED RIVER DELTA
(REGIONAL LEVEL)

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Figure H.3 Concept of Cargo Distribution and Trading Center in Red River Delta
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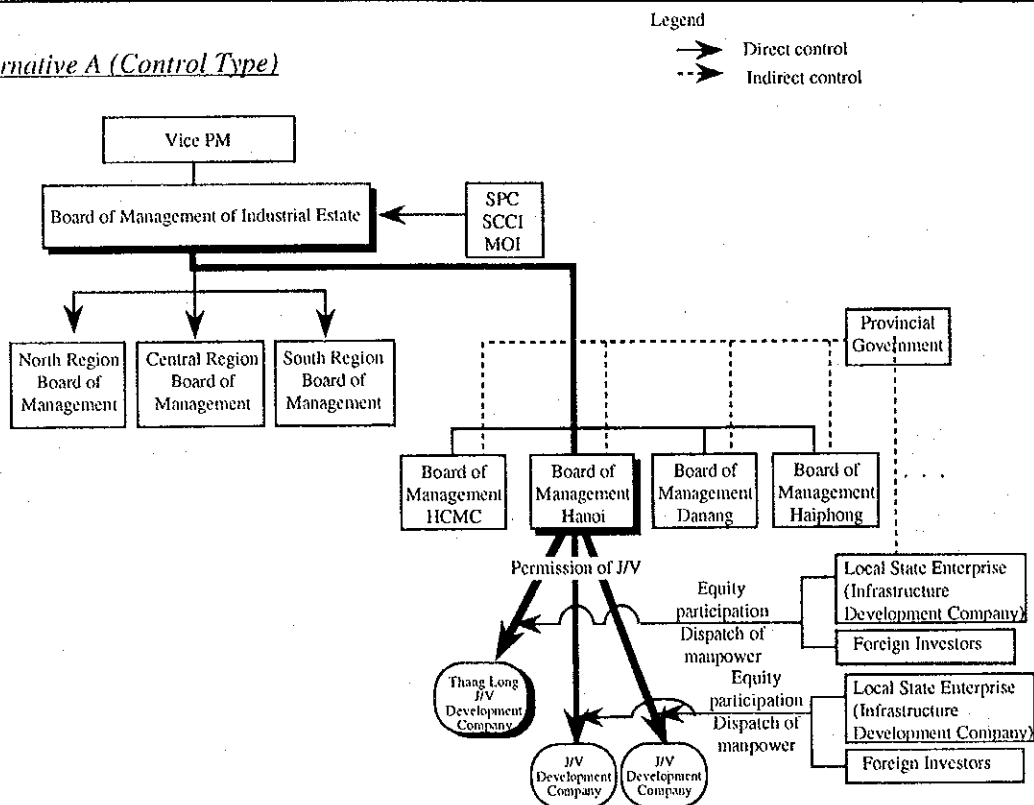




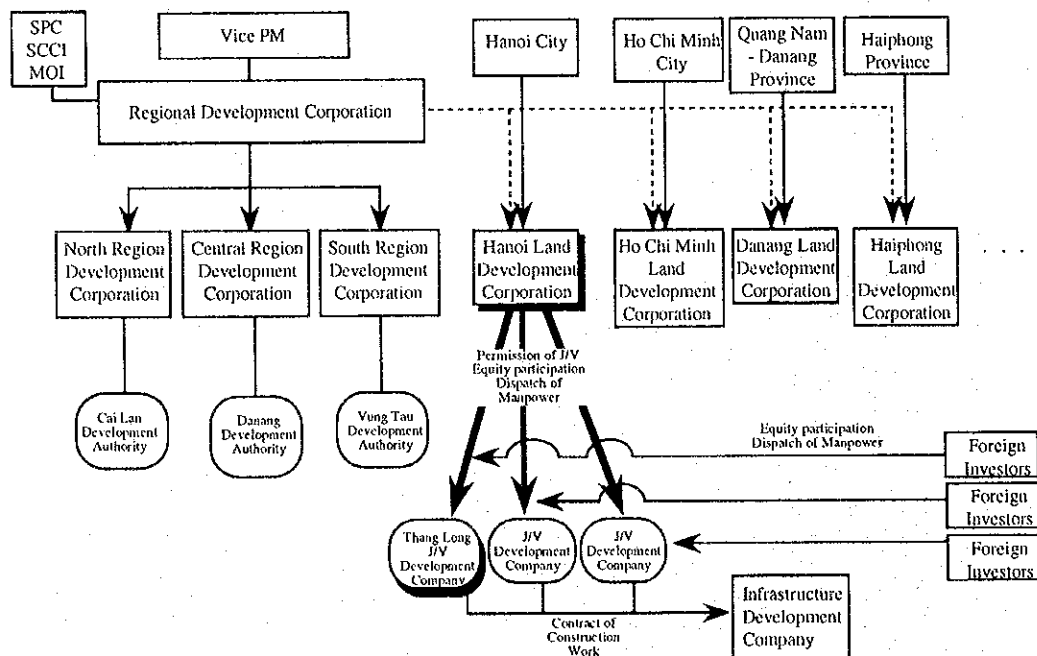




Alternative A (Control Type)



Alternative B (Practical Type)



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 Figure H.8 Organization Alternatives for
 Development of Industrial Estate in Vietnam
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APPENDIX-I

**PRE-INVESTMENT STUDY ON DEVELOPMENT OF
SELECTED INDUSTRIAL ESTATES**