

# **Geographical Implications of the Tumen River Area Development (TRAD)\***

**Ki-Suk Lee**

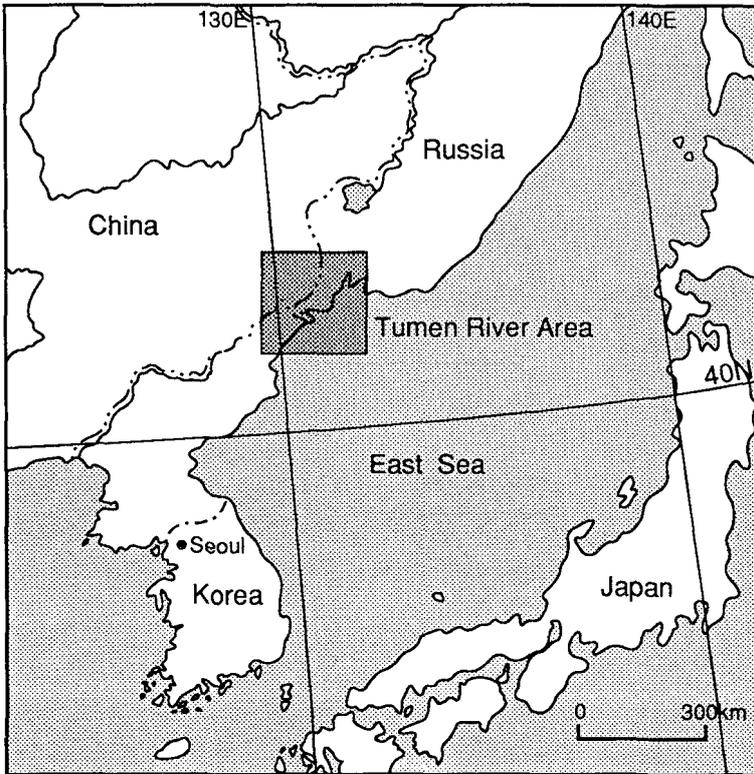
*Department of Geography Education*

## **I. Introduction**

This paper tries to point out several geographical implications regarding idea and locational selection of the TRAD. A designated area is geographically an unique and a remote area from major urban area and industrial development (Fig. 1). Also major strategy of the TRAD intends to employ a model of Export Processing Zone (EPZ)/Special Economic Zone (SEZ) as a vehicle for regional development. Concerning the selections of the area and main strategic idea, a few geographical and policy implications could be driven from recent studies of EPZ's structural evolution and field trip observation. Major questions concerning this TRAD project is whether this project is locationally feasible in terms of selection of zone. In operational sense, major concerns are whether allocation of EPZ or SEZ is suitable for this region in operation.

To provide the basic understnading of the beginning of the TRAD and the progress of EPZs, the paper is divided into the following three sections: one, the Basic Concept of the EPZ; two, the Emergence and Progress of the TRAD Project; three, Geographical and Policy Implications. Information related to the TRAD is derived from major documents that circulated only internally in the Pyongyang meeting and Seoul meeting, newspaper articles and other unpublished materials. Additionally, my field work to the Chinese side of the Tuman

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**FIGURE 1**  
FAR EAST ASIA AND TUMEN RIVER AREA

River area during three days of July 1992 provided help for this study.

However, this paper has two limitations: one is that final comments will have to wait until the master plan comes out at the end of the year; the second is that extensive field trips should be made before a firm evaluation can be made of the plan because of the target area's wide region and various cultural backgrounds.

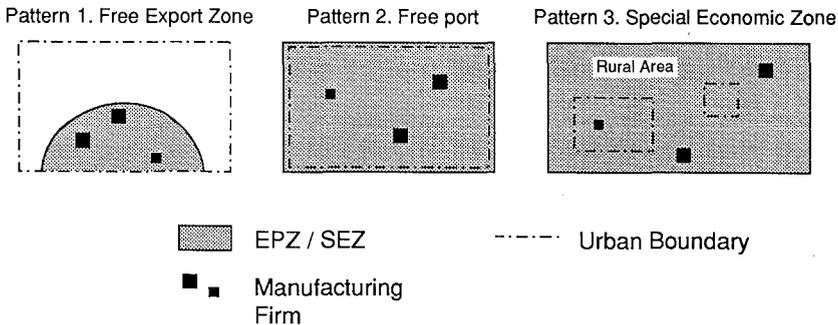
## **II. Basic Concept of EPZ/SEZ and Its Structural Evolution**

### *A. Basic Concepts and Locational Patterns*

Generally, the main purposes of Free Export Zone (FEZ),

Special Economic Zone (SEZ), and Export Processing Zone (EPZ) are basically identical even though their scale and size, government management policies, development strategies, and trading policies are slightly different. The main reasons for the establishment of zones are 1) attracting foreign capital and technology, 2) enhancing domestic employment, 3) increasing export and foreign exchange earnings, 4) assistance to the national economy and industrialization (United Nations, 1985; Lee and others, 1987). At the same time, most Asian countries where EPZs have been established have additionally achieved expanding international markets, effect of import substitution, substitution of domestic raw materials for EPZ products, and industrial linkage development with domestic industries. Essentially, EPZs have played very important roles in the beginning stages of export-oriented industrial development.

Currently, we can recognize three spatial patterns of EPZ based on location, size, and main establishment purposes (Fig. 2). The first one is an original form of EPZ that is located in a pre-existing city where there is access to an urban infrastructure, easy supply of semi-skilled labour, and connection with diverse industries. In these cases, the zone size is limited to 100-300 ha. The second form is where a whole city is designated as a free trade zone or port such as Hong Kong and Singapore. The third type is a relatively broad region including a major city and secondary city with a surrounding rural area like the Chinese Special Economic Zone. In this case, foreign capital investment expands to agricultural development, service, and tourism industry as well as industry itself. This



**FIGURE 2**  
THREE PATTERNS OF EXPORT PROCESSING ZONE

means SEZ, the concept, has been broadened to include the development of an entire region.

According to the previous studies, there are many determinant factors which should be considered when choosing an EPZ location. At the beginning of EPZ establishment, in most case supply of raw materials, international market, capital, and government support of administration are pre-determined. Additional important factors are the selection of a specific site where there are minimum physical obstacles related to production activity, geographical accessibility to import and export, abundant labour force and its continued supply, easy access to urban infrastructure and supply of urban services, the possibility of subcontracting or outprocessing, housing and other amenities, and social political security of the host city. Among these, coastal location and convenient transportation networks, labour supply, and easy establishment of subcontracting and outprocessing are the most important factors.

### *B. Structural Evolution of Zones*

Since EPZs were established in the 1960s and 1970s, the types of industries, products, labour relations, production linkages and government policy have been rapidly transformed. This change has taken place within the national context of upgrading industries forced by global restructuring of manufacturing. The process of transformation of the EPZs outlines the process of transformation in terms of the kind of firms, the likely linkages between the firms, and the required administrative response (Lee and Wu, 1992).

The recognition of three stages of development of EPZs may provide some ideas for new development plans and adjustment schemes for the existing EPZs (Table 1). It is valuable for other countries which already have EPZs or are in the process of developing EPZs to remember that this transformation process is highly correlated with the change of the host country's economic development and global shifting of manufacturing industries.

**TABLE 1**  
STAGES OF EXPORT PROCESSING ZONE DEVELOPMENT<sup>1</sup>

	First Stage	Second Stage	Third Stage
Characteristics	<ul style="list-style-type: none"> <li>-dominated by foreign firms;</li> <li>-largely labor intensive type of manufacturing</li> <li>-potentially high number of workers;</li> <li>-few subcontracting linkages (except purely to take advantage of lower labor costs);</li> <li>-highly reliant on foreign investments;</li> </ul>	<ul style="list-style-type: none"> <li>-towards high levels on interactions between firms within the EPZ;</li> <li>-number of workers still high but likely to decrease as the firms move towards the hiring of more skilled workers;</li> <li>-increasing number of out of zone subcontracting linkages;</li> <li>-increasing number of domestic investors;</li> </ul>	<ul style="list-style-type: none"> <li>-towards high levels of specialization;</li> <li>-increasing levels of automation;</li> <li>-number of workers likely to decrease;</li> <li>-large proportion of skilled workers;</li> <li>-increasing percentage of domestic investors and joint ventures;</li> </ul>
Type of Industries	<ul style="list-style-type: none"> <li>-athletic/sports shoes;</li> <li>-garments;</li> <li>-assembly of electronic components;</li> </ul>	<ul style="list-style-type: none"> <li>-labor intensive type of manufacturing replaced by ones with relatively more technology contents;</li> <li>-firms develop more production linkages with each other;</li> </ul>	<ul style="list-style-type: none"> <li>-towards more R &amp; D activities or closer links with the R &amp; D activities of the parent firm or other firms;</li> </ul>
Regional Impacts	<ul style="list-style-type: none"> <li>-large in-migration of prospective workers;</li> <li>-impacts largely on the local community with greater demands on social services and infrastructure capacity;</li> </ul>	<ul style="list-style-type: none"> <li>-in migration slowing;</li> <li>-increasing number of subcontracting links with neighboring urban and rural centers;</li> <li>-regional impacts increasingly due to closer production links;</li> </ul>	<ul style="list-style-type: none"> <li>-towards more R &amp; D and manufacturing linkages within the zone;</li> <li>-increasing national impacts due to the type of industries located within the zone;</li> </ul>
Administration	<ul style="list-style-type: none"> <li>-providing incentives for investors;</li> <li>-concerned with filling up the zone with as many foreign investors as possible;</li> <li>-concerned with controlling movement of materials in and out of the zone;</li> <li>-high investments in infrastructures;</li> </ul>	<ul style="list-style-type: none"> <li>-more selective about investors;</li> <li>-concern with the "right" type of firms and sectors which locate within the zone;</li> <li>-must deal with issues related to out of zone production linkages;</li> </ul>	<ul style="list-style-type: none"> <li>-maintaining environmental quality;</li> <li>-high investments in amenities and possibly R &amp; D facilities (common facilities);</li> <li>-increasingly selective about the firms locating in the zone;</li> </ul>

<sup>1</sup> Lee and Wu, 1992, 5.

### **III. Emergence of the TRAD and Important Concepts**

#### *A. Idea and Progress*

According to UNDP report (UNDP, 1991), the idea for Tumen River Delta Development came from an international conference on the Economic Development in the Region of North-East Asia which was held in Changchun, China in July 1990, sponsored jointly by the East-West Centre of USA, Asian-Pacific Society of China, and United Nations Development Programme (UNDP). The Conference focused most of its attention in the development of the Tumen River Area which it considered the key to international co-operation among countries of North-East Asia. Since then DPRK, ROK, Mongolia and China with the support of the UNDP have accepted preparatory assistance for the Tumen River Area Development Programme (TRADP) which started in December 1991.

The first meeting by the UNDP was held on July 6-7, 1991 in Ulaanbataar, Mongolia. The second meeting followed on October 1991 in Pyongyang, where the first "Mission Report" that describes the main objectives, regional development concept, and other agenda was proposed. The following meeting in Seoul on February 1992 was the first meeting of the Programme Management Committee (PMC). It dealt with clarifying the development concepts and options, and reviewing of potential economic and financial implications of the programme. Since then, there was the fourth meeting in Beijing, field work and another meeting in Vladivostock last summer and a telecommunication meeting in Seoul this year in January.

The UNDP 18-months feasibility study, which received funding of 3 million, will finish the masterplan by the end of 1993. And the committee's masterplan will then be submitted to the leaders of the six countries for approval. The main objective of the UNDP mission was to assist the four countries concerned (the three nations bordering on the Tumen River plus Mongolia) to develop the Tumen River delta region so as to take advantage of its strategic location and the many other attributes that make it a region with exceptional potential.

### *B. Basic Concepts and Strategies*

Originally, basic concepts for the TRAD came from the importance of the Tumen River basin in the economic development of North-East Asia. The following points are considered in UNDP agenda (UNDP, 1992):

- the advantageous geographic location for the development of international transportation for the subregion (both sea and land) benefitting coastal countries along the Sea of Japan (East Sea) as well as the landlocked PMR, with the distinct prospect of serving as the pole of a major land bridge to the interior of Asia and possibly, Europe;
- the complementarity of the natural resources, labour force and industrial structure of the countries in the Region (Table 2);
- rich natural resources, including minerals, energy, water, farmland, and forests;
- the desire of the frontier countries of China, DPRK, RFR (formerly USSR) for the dynamic economic development in the Tumen River area;
- the expressed interest of the countries neighboring the Tumen River Area, especially Japan and Republic of Korea, in the promotion of international trade and investment in the area providing opportunities for complementarity between resource and capital rich countries

The above five fundamental necessity and importance for this region's development were later summarized the following three major concepts (UNDP, 1992, 96):

- 1) It will provide a major transportation hub and terminus for and Euro-Asian landbridge;
- 2) It is a strategic location for a major industrial complex and commercial center;
- 3) It will become a dynamic city region, absorbing perhaps as many as 10 million workers coming off the farms throughout the region.

In addition to the above ideas, political situations such as new fashion of regionalism and the possibility of an economic bloc in East Asia, and China's coastal port open door policy running from Shenzhen toward northern areas, coincidentally affected and timely matched with the idea of the TRAD. Also, there is an expectation of forming a major trading, financial, and tourist

TABLE 2

THE MUTUAL COMPLEMENTARY CONDITIONS OF NORTHEAST ASIAN COUNTRIES<sup>1</sup>

Nations and Regions	Advantages	Disadvantages
Japan	Capital savings, advanced technology, plenty of superior equipment ready to move out, vanguard industrial products and management experiences.	Severe shortage of energy and industrial resources, insufficient grain for animal husbandry and some agricultural products, comparative deficiency of labor.
The Soviet Far East	Plenty of forest, non-ferrous metal ore, aquatic resources, oil, gas, coal and some products of heavy and chemical industries (such as steel, fertilizers, etc.).	Severe shortage of agricultural and light industrial products, lack of labor and capital, backward industrial equipment and management experience.
Northeast China	Favorable agricultural conditions, adequate and various agricultural products (such as corn, soybean, meat, fruit), some textile industrial products, oil, coal, building materials, Chinese medicinal herbs, and excess labor.	Lack of capital, advanced equipment, technology and management experience, comparative shortage of some mineral resources, conditioned infrastructure.
DPRK	Rich mineral resources, metal ore and simple processed products, aquatic products, some industrial commodities and plentiful labor.	Shortage of capital, insufficiency of farm, sideline and light industrial commodities, backward equipment and technology.
ROK	Surplus capital, advanced technology and equipment ready to move out, vanguard industrial products.	Shortage of energy and industrial resources, lack of grains for stock raising, insufficiency of labor.
Mongolia	Plentiful products of animal husbandry and of mineral ores, especially fluorospar.	No convenient way to communicate directly with other Northeast Asian nations, lack of capital, technology, equipment, farm products and light industrial commodities.

Source: Regional Cooperation in Northeast Asia and the Exploitation of Triangle Area of Lower Tumen River (for the Second International Conference on the Economic and Technological Development of Northeast Asia, Changchun, 1991) Geographical Institute of Northeast Asia, Northeast Normal University, Changchun, Jilin Province, 130024, People's Republic of China.

Authors: Chen Cai, Yuan Shuren, Wang Li, Ding Sibao.

<sup>1</sup> UNDP, 1991, 2-2.

center as an eastern anchor for a Euro-Asian landbridge (Stauffer, 1992, 99).

Strategically, it is not an easy task to implement this international boundary zone development. A detail proposal and masterplan, and field trip and survey is proceeding according to the working schedule. However, one of major strategic method for the development of this region divides into three economic regions base on regional scale, the urgent need of transportation hub, and characteristics of Tumen river delta area (Fig. 3):

*Tumen River Economic Zone (TREZ)*—a roughly 1,000 sq km free district including China's Hunchun, DPRK's Najin and Russia's Posyet.

*Tumen Economic Development Area (TEDA)*—a hoof-shaped plain of 10,000 sq km including China's Yanji, Russia's Vladivostok and DPRK's Chongjin.

*North East Asia Regional Development Area (NEARDA)*—an expanded region of 370,000 sq. km at the river valley, binding the border provinces of the three countries.

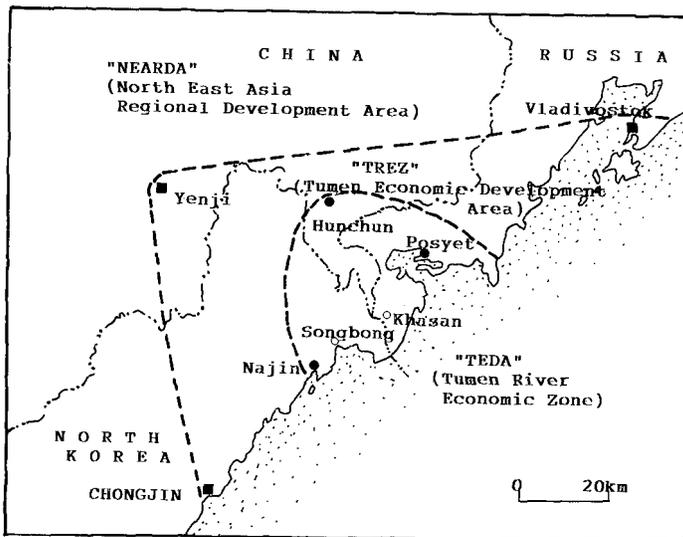


FIGURE 3  
TUMEN RIVER AREA DEVELOPMENT ZONES

The other strategic idea is to set up a quasi-EPZ or SEZ as an

integrated industrial complex. However, momentarily, three nations have proposed their own development ideas in this region. China has already launched a Special Economic Zone at Hunchun in a 15 sq km inner city region (Fig. 4) and started to restore an inland port at Bangcheon, 15 km away from the sea. North Korea has publicized a landuse map of Najin-Seonbong

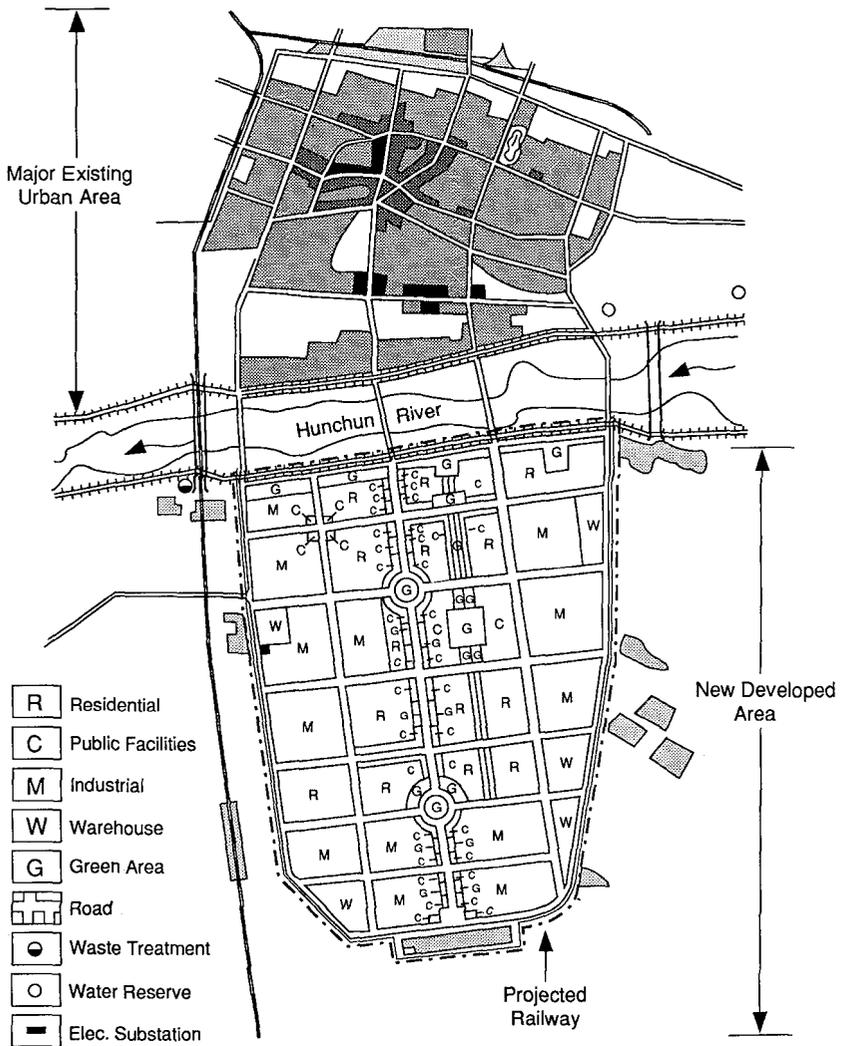


FIGURE 4  
HUNCHUN SPECIAL ECONOMIC ZONE

special economic zone (Free Trade Zone) in a 621 sq km region along the major coastal line from the lower Tumen River estuary. Russia also has finished a preinvestment study for the establishment of a free economic zone in Primorsky region (UNIDO, 1991), enclosing an area from Khasansky at lower Tumen River area to Nakhodka in a 15,000 sq. km region.

Practically, UNDP is developing a whole master plan under the participant countries' cooperation, but the fact can not be denied that the bordering countries have been separately developing their own planning strategies since the beginning of the international meeting.

### *C. Target Industries to be developed*

According to Mission Report, the TRAD intends to locate four basic industry categories within a Special Regional Economic Zone (UNDP, 1991, 6-1).

Primary Industries - Industries processing raw materials into foodstocks for other industries.

Secondary Industries - Industries processing foodstock from primary industries into products for use by light industries.

Light Industries - Industries producing the final consumer product, organized in a Special Economic Zone (e.g., assemble industries and agro-industries with food processing).

Support Industries - Firms that manufacture essential constructional material and provide other goods and services to primary, secondary, and light industries; other businesses, and the general public.

The other two major sectors are commercial development and tourism, recreational development.

### *D. Total Cost Assessment*

The Mission has tentatively assessed that if the region is to develop its expected potential over a span of approximately 20 years there will be a need for as many as 10 or 11 modern marine terminals, and housing and related facilities for upwards of 500,000 people in new communities. The related total costs may run as high as US \$30 billion (UNDP, 1991, 2-4).

All of the above ideas and factors reinforce the concept of the Tumen delta area as a future Hong Kong, Singapore or Rotterdam with the potential for entrepot trade and related

industrial development akin to theirs (UNDP, 1991, 2-1).

#### **IV. Geographical and Policy Implications**

At the beginning of this paper, the advantages and disadvantages of this development project were discussed in a broad sense without any evaluation of physical conditions along Tumen River and/or locational characteristics required for the establishment of EPZs and SEZs. As long as the TRAD is mainly trying to manipulate the idea of EPZ/SEZ industrial complex, an extensive discussion on EPZ/SEZ location factors and their related problems should be followed.

First, the general aspects of physical conditions along Tumen river will be briefly discussed; second, major problems related to the establishment of EPZ/SEZ in terms of resource supply, labour force composition, transportation networks, and the industrial linkages of the zones. Finally, there is a fundamental problem of the political geography of the borderland region.

##### *A. General Characteristics of Physical Environment*

The 530-km-long Tumen River rises in the Packdu (Changbai) Mt. in Korea's northern province, the mythic birthplace of the Korean people, and China's Jilin province. It flows eastward along the China-N. Korea border into the East Sea, except for the last 15 km of the Tumen, where it forms the border between Russia and N. Korea. The would-be target area of the trilateral border along the Tumen River is restricted to a very limited area in lower river region, stretching 146.5 km from Saiwanz, China to the estuary of the river (Fig. 5). Except for the Hunchun basin, most of lower region is under 80 m above sea level and is composed of permanent marshlands, lagoons, and sand dome dunes consistently being rearranged by strong winds. Area under 5 m above sea level suffer from bad drainage in the summer rainy season every year. Since all relations with the Japanese were blocked in 1938, the river has become considerably limited to navigation because of its shallowness (average depth: 3-4 m) and seasonal deposit of sediment (annual sediment: 4,060,000 tons; about 0.64 kg per cubic meter of flow). In order to construct and maintain the river ports, at least

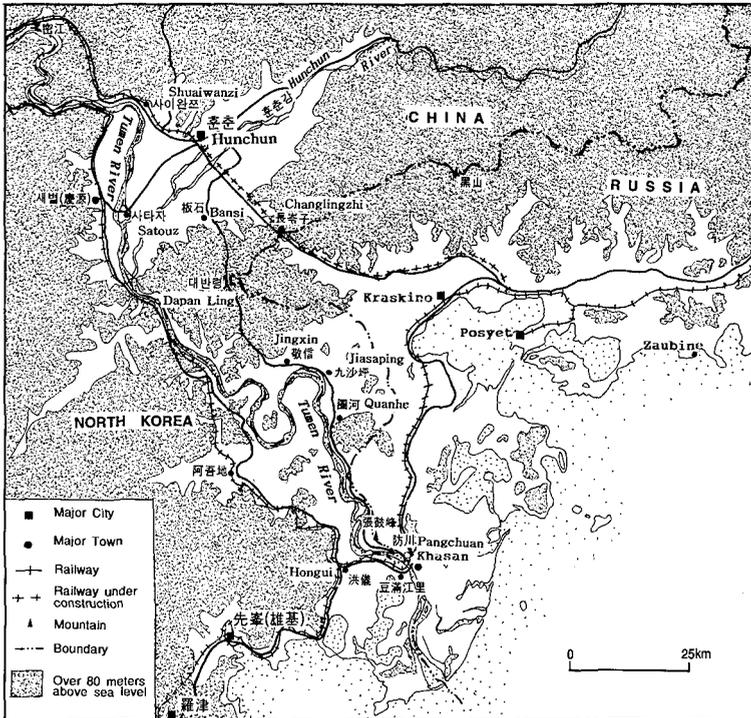


FIGURE 5  
TUMEN LOWER RIVER REGION

10,000 tons of sediment per day would regularly need to be dredged or else dams would be built to control it. This is one of obstacles to using the river as a transport network. The other one is that the river is frozen almost five months, between November and April. This severe winter climate is not the same as that of Hong Kong, Singapore, or Rotterdam.

Physically, the trilateral border region has remained a primitive and virgin, even backward, landscape for a century, without any modern development because it was a zone of political and military conflict. In other words, this bordering area could be the one and only place in the world where the ecological environment has never been forcefully disturbed by aggressive human beings in the twentieth century. No one wants the destruction of environmental ecology, if anyone knows about the real facts, which the TRAD will perhaps effect.

### *B. Major Issues Related with EPZ/SEZ Establishment*

*The Selection of Sites and Industries for the EPZ or SEZ* will be a major problem if the TRAD is going to achieve regional industrialization and development through the establishment of the EPZ/SEZ. The possibility of an integrated industrial complex zone that comprise a residential sector, commercial area, and other supporting service industries is highly confined in this lower part of the river (TREZ), because of the limited open space and physical obstacles.

The other immediate problem is the selection of major industries for the EPZ and SEZ. Practically, resource-based industrial development, including tourism, has nothing to do with the strategies of an EPZ and SEZ. The most important factor in the successful operation of an EPZ/SEZ is the presence of pre-existing urban areas and industrial bases nearby, such as Hong Kong in the south of Shenzehn and Pusan in the east of Masan. However, there has never been development of any kind of industry or urban complex along this river area for a century in history. Therefore, appropriate industries should be carefully chosen so that they fit into a global shift of manufacturing process. Also selection process should match with the structural evolution of an EPZ in general.

*Labour and Raw Materials Supply* does not seem to be good, in spite of being highlighted as prime factor why this region is favorable for development. At the begining stage of the establishment of an EPZ/SEZ, the sex and age of the labour force is extremely distictive. For example, female workers made up over 70% of all workers between the age 16 and 24, with an average 11 years of education. Additionally, the labour force should include a certain portion of semi-skilled labour.

Based on the known statistical data of N. Korea and Russia in this region, their supplying of a labour force would involve relocation of population from other parts of the region. China is exception. It has abundant population in this area. In fact, regional development always requires diverse labour pool markets including the service sector.

The Mission Report indicates the availability of plenty of raw materials such as agricultural products, minerals, coal, iron, timber, energy sources including oil and gas, and others.

However, the majority of raw materials used for EPZ/SEZ's are rarely supplied from primary resources. Rather, the EPZ/SEZ's are highly reliant on sophisticated parts or semi-products which, in most cases, during the beginning stages of the EPZ, are imported from industrialized countries. Therefore, as the EPZ progresses, a key factor in the success of the operation is how many local raw materials can be substituted for imported raw materials. The establishment of an EPZ/SEZ is not always appropriate for regional economic development. UNDP should make clear the strategies TRAD will follow in regional industrialization and development.

*Industrial Linkage Networks of EPZ/SEZ* are recognized as an important mechanism for the step-by-step development of EPZs (Lee and Wu, 1992). There are two linkages: one is the development of a subcontracting linkage for the outprocessing of goods; the other one is an internal industrial linkage based on the transactions between the firms within the zone. The latter one is related to the division of specialization of firm products at the later stage of EPZ development. However, the formation of a subcontracting linkage outside the zone has tremendous multiplied impacts on local communities and regional economic development in terms of job creation, labour force circulation, efficient management of the firms, and diffusion of rural industrialization. The development of the subcontracting linkages is highly subject to the degree of local and national level of technological development and the related industrial structure. Also, pre-existing cities and large labour markets of metropolises are essential for the linkage formation of EPZ. According to the previous Masan study (Lee and others, 1990), subcontracting employment accounts for more than the number of workers employed in the Masan Free Export Zone itself.

Based on current observation of the Tumen River Economic Zone, it is hard to find the possibility of industrial linkage formation with the near-by rural area or with major cities which have developed a diverse industrial infrastructure. This means there is no place to get general service supplies which an EPZ/SEZ will consume to maintain the firms and workers.

*Transportation Networks* are an important part of the infrastructure for regional development and trading. Highway networks, an airport, and a container port, and opening-up of a

regular international freight shipping carrier line are prerequisite infrastructure for EPZ development. The establishment of an international air port near the EPZ is a particularly important locational requirement because many of an EPZ's products tend to be small size and high-tech products.

### *C. Instability and Complexity of Boundary Zone*

Historically, an international boundary area has rarely been a favorable location for industrial development. Even though there are a few exceptions, all show a tendency to concentrate development on one side of the border. It seems hard to allocate equally industrial facilities along the projected river side. Basically, no matter how firmly the international treaty for the river area development has firmly proposed, the border region tends to be a politically unstable region.

Tumen River area has been well-known as a region of conflict since 1860, when tsarist Russia forced the Qing Dynasty (1644-1911) to cede a total of 400,000 sq km of China territory by the unequal Sino-Russian Treaty of Peking. Later Manchuria was controlled by the Japanese. In 1938, Japan blocked the river after being defeated by the Soviet Union (Beijing Review, 20-26 April 1992, 6). During the Japanese occupation of the region, Japan planned to develop the land bridge from this area to Europe, through Mongolia, as part of Japanese military adventurism. Actually, the target area was not the Tumen river. The ports of Najin and Chongin were developed as the industrial city and navy military base as well as a gateway city to Japan.

Since 1945, the Korean War and Sino-Soviet rivalry has kept more tension in this region (U.S. Department of State, 1966) and additionally military hardware complexes have been built along both sides of the river in invisible places. Until now, many military bases have remained heavily equipped and staffed by military personal. The whole area of the border land is controlled by military authority even though it is officially designated as an open area in China since January 1992.

Practically, the lower Tumen river area has been known as a territorially disputed area, a militarily strategic area for all three nations, the conflict area of diverse races, and a remote area far from the powerful influences of central governments' support whenever the economic situation is deteriorating. In addition, in

order to make way for the construction of an industrial complex and urban structure along this river bank or other flat areas, there remains the huge job of removing the military installation.

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