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Yasuo MASAI

Present-day urbanization of the world is well characterized by the existence of many cities with a population of one million or more, in other words, million cities.[1] If metropolitan areas having the same population are included, the tendency becomes much clearer. Not only developed countries but also developing countries now have many of this sort. Population statistics of administrative cities in the world show that China, Japan, India, USSR and USA now have five cities or more of this category (Table 1). The USA having six, however, counts more than 30 if metropolitan area statistics are employed. West European countries also have many more large cities of this category if metropolitan areas are included. The causes for the development of million cities or the increase in the number of million cities are multiple but the main ones are as follows: industrialization, development of commerce and trade, and inmigration of rural population into cities motivated by other than industrialization and commercialization of the modern society.

An international comparison of the million cities of the world with special reference to sea-coast, bay-coast and river-side location reveals a large variation between the nations and the world regions. Japan's ten largest cities (Tokyo, Yokohama, Osaka, Nagoya, Kyoto, Kobe, Kita-Kyushu, Sapporo, Kawasaki and Fukuoka) have been compared to the world's million cities as to the hydrological location in the hope that its peculiar characteristics could be clarified.[2] Japan's ten largest cities with a population of one million or more are all located on the sea-coast except two: Kyoto and Sapporo. Even these two are not located very far from the sea-coast as compared to many such cities in the world, but the built-up areas themselves have been mostly developing inland without using the sea-coast for their own contiguous urban lands. By contrast, the other eight cities are typically sea-coast-oriented using the sea-coast or bay-coast as significantly integral part of their own urban purposes within the contiguous urban areas. This kind of consideration as to the distinction between inland and sea-coast is very necessary, otherwise the definition in question should be too subjective.[3]

European type cities tend to be located inland as is well known. This is well exemplified by the cities of the Soviet Union. Their eleven largest cities (Moscow, Leningrad, Kiev, Kharkov,

Table 1.   Hydrological Location of the Million Cities in the World (1978)

S — Sea-coast   R — River-side (large rivers only)

L — Lake-side (large lakes only)   X — Without S, R nor L

Country	City		Country	City	
Japan	Tokyo	S	Pakistan	Karachi	S
	Yokohama	S		Lahore	R
	Osaka	S	Iran	Teheran	X
	Nagoya	S	Iraq	Baghdad	R
	Kyoto	X	Syria	Damascus	X
	Kobe	S	Turkey	Istanbul	S
	Kita-Kyushu	S		Ankara	X
	Sapporo	X	Egypt	Cairo	R
	Kawasaki	S		Alexandria	S
	Fukuoka*	S	Morocco	Casablanca	X
S. Korea	Seoul	X, (R)	Ethiopia	Addis Ababa	X
	Pusan	S	Nigeria	Lagos	S
N. Korea	Pyongyang	X, (R)	Zaire	Kinshasa	R
China	Beijing	X	USSR	Moscow	R
	Tianjin	R		Leningrad	S
	Harbin	R		Kiev	R
	Shenyang	R		Kharkov	R
	Luda	S		Odessa	S
	Qindao	S		Gorkiy	R
	Taiyuan	X		Kuibyschev	R
	Xian	R		Sverdlovsk	X
	Shanghai	R		Tbilisi	X, (R)
	Nanjing	R		Novosibirsk	R
	Wuhan	R		Tashkent	R
	Chongqing	R	Poland	Warsaw	R
	Chengdu	R	Czechoslovakia	Praha	R
	Guangzhou	R	Hungary	Budapest	R
Taiwan	Taipei	X, (R)	Romania	Bucuresti	R
Hong Kong	Hong Kong	S	Austria	Vienna	R
Vietnam	Ho Chi Minh	R	E. Germany	Berlin	R
Thailand	Bangkok	R	W. Germany	Hamburg	R
Singapore	Singapore	S		Munich	X, (R)
Philippines	Manila	S		W. Berlin	R
Indonesia	Jakarta	S	Belgium	Brussels	R
	Surabaya	S	France	Paris	R
	Bandung	X	UK	London	R
Burma	Rangoon	R		Birmingham	X, (R)
Bangladesh	Dacca	R	Italy	Roma	R, (X)
India	Delhi	R		Milano	R
	Calcutta	R		Torino	R
	Bombay	S		Napoli	S
	Kanpur	R	Spain	Madrid	X, (R)
	Madras	S		Barcelona	S
	Bangalore	X			
	Hyderabad	X			
	Ahmedabad	R			

Canada	Montreal	R		Peru	Lima	X
USA	New York	S, R		Chile	Santiago	X
	Chicago	L		Argentina	Buenos Aires	S
	Los Angeles	S				
	Philadelphia	R		Uruguay	Monte Video	S
	Detroit	R		Brazil	Rio de Janeiro	S
	Houston	S, X			Sao Paulo	X, R
Mexico	Mexico	X			Belo Horizonte	X
	Guadalajara	R			Recife	S
	Monterrey	X		Cuba	Habana	S
Venezuela	Caracas	X		Australia	Sydney	S
Colombia	Bogota	X			Melbourne	S
	Medellin	X				

* Fukuoka, Japan, with a population of 999,000 in 1978 is included in this list.

Gorkiy, Odessa, Kuibyshchev, Sverdlovsk, Novosibirsk, Tbilisi and Tashkent) are all located inland with the exceptions of Leningrad on the Baltic and Odessa on the Black Sea. Rapid development of such medium-size cities as Riga, Baku and Vladivostok located on the sea-coast (including Caspian Sea) will exert some influence on the pattern of hydrological location of the Soviet cities in the future, but at the present moment, its pattern is characteristically inland-oriented. Soviet's medium and small cities also have a similar tendency significantly.

The Federal Republic of Germany has three cities of this category (Hamburg, Munich and W. Berlin), but none of them are located on the sea coast. Another great urban agglomeration, the Ruhr, is not located on the sea-coast either. Similar tendency is clearly observed in the other cases of all European countries — E. Germany, Poland, France, Spain, Italy, and Romania. Even the UK, which is well known for its sea-faring activities fostered largely by its insularity, is not as sea-coast-oriented as one might think. London is an estuarine city on the Thames and Birmingham is located inland, although it is connected by a network of river and canal systems. Paris is a typical inland city, and so is Madrid. Italy's largest cities are also inland-type except Napoli. It is not necessary to mention the inland nations of Europe such as Czechoslovakia, Hungary, and Switzerland. Scandinavian countries are rather sea-coast-oriented as far as the location of cities is concerned, but at present they have no cities which fall in the category of million cities. In sum, Europe now has only four sea-coast million cities including those of the Soviet Union, excluding Istanbul in European Turkey. Needless to say, these inland cities are endowed mostly with navigable large rivers or estuaries. Europe's largest port city (in terms of goods handled) is Rotterdam with Europort and with less than a million population now is a good example of a city located on an estuary — the Rhine. Estuarine location may be related to coastal
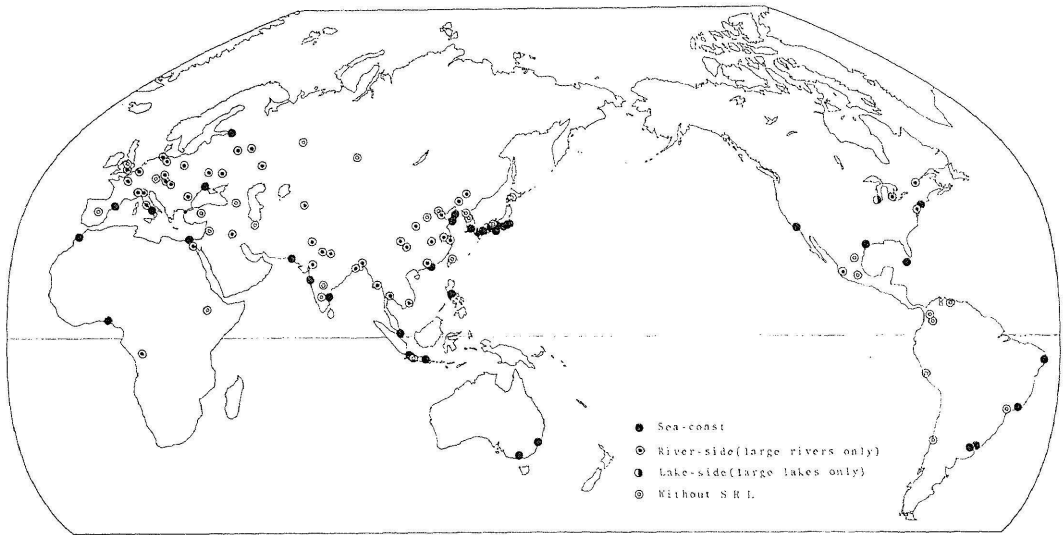
Figure 1. Million Cities in Relation to Hydrological Location

location, but there still is a clear difference between the two.

The United States of America now has six cities with a population of one million or more (New York, Chicago, Los Angeles, Philadelphia, Detroit and Houston). These are somehow between Japan and Europe as regards hydrological location. New York and Los Angeles have large sea-ports and Houston is also regarded as a city with a sea port (on a lagoon). Chicago is a very typical example using lake frontage for its open port within the St. Lawrence Seaway System. Philadelphia and Detroit are both located on a river, the former on the Detroit River between Lake St. Clair and Lake Erie and the latter on the Delaware River. These two also have a large river port each. Nearly thirty other large cities with a metropolitan population of one million or more tend to be located inland as a general rule, reminding one of the European type location. But the largest ones, New York and Los Angeles, each having much more than 10 millions in their respective metropolitan areas, are typically sea-coast-oriented, offsetting the other tendency to a large degree.

China and India, the two giant countries in Asia populationwise, show more or less mutually different trends. India tends to have both types, whereas China is of European type to a very significant degree as the table shows. China's fourteen largest cities are mostly connected with the sea by large rivers which are navigable. Shanghai's location on an estuarine tributary of the Chang River is well known in this respect, but most of the other cities are characteristically located on ordinary rivers. Five of China's largest cities are found on or near the main stream of the Chang River (Shanghai, Nanjing, Wuhan, Chongqing and Chengdu). The other large river, the Huang (Yellow), by contrast, has no cities of this

category on its main stream, although Xian and Taiyuan are found on its tributaries. The Chu River has Guangzhou on its estuary near the mouth. China's capital, which is the second largest in population, is not located on a large river, nor on the sea-coast. This may signify this country's general trend. Tianjin, Harbin and Shenyang are other examples of river-side cities. Only Luda and Qindao are typical examples of China showing sea-coast location. Taipei also falls in the category of inland cities, although it is located on a small river. Even if Hong Kong (sea-coast location) is regarded as a city of China, the general tendency could be altered only a little.

The eight largest cities of India are varied in this respect. Bombay and Madras are typical sea-coast cities as is well known. Calcutta is a typical riverine port city but in actuality, it is on the estuary of the Hooghly, a distributary of the Ganga Delta, located not very far from the Bengal coast. Kanpur, Bangalore, Delhi and Ahmedabad are other river-side cities, but Hyderabad does not have a large river. Compared to China, India's largest cities show a little more sea-coast orientation. The reason for the distinction between China and India may be attributed to their respective historical backgrounds in connection with colonization.

Southeast Asian large cities tend to like sea-coast location in general. Singapore, Manila, Jakarta and Surabaya are good examples, all facing the sea directly. Even Ho Chi Minh and Bangkok are estuarine cities, the former on the Song Nha Be and the latter on the Chao Phraya with easy access to the sea. Bangkok is now building a sea port at Paknam on the sea-coast of the Gulf of Siam. Rangoon is another example of a million city in this world region to show a river-side location, although it is of an estuarine nature. Dacca, though it is found in South Asia, falls in this type of city location. It is very interesting to note that all the big cities between Vietnam and eastern India are estuarine, Ho Chi Minh, Bangkok, Rangoon, Dacca and Calcutta being good examples. Even Hanoi, Thonburi and Hawrah, other large cities, are similar in this connection. The only example showing inland location in this world region is Bandung in Indonesia.

In West Asia and North Africa, there are several cities with a million population or more. But the general tendency is inland-oriented to a great degree. Istanbul and Alexandria are typical sea-coast cities, but all others are located inland. Such cities as Teheran, Damascus, Addis Ababa and Casablanca do not have significant rivers at all. Kinshasa and Lagos are two examples in Black Africa, and the former is a river-side location and the latter a sea-coast location typically.

Latin America is somewhat different from all other world regions, since its large cities are located either on the sea-coast or inland without having significant riverine location as in the case of Europe and China, although Buenos Aires and Monte Video may be called river-side

cities. The two cities are, in actuality, located on the sea-coast, because they are on the estuary of La Plata in the strict sense. The reason why the two are classified as sea-coast ones is that the location of them is on a very wide estuary, so wide that one should feel that they are situated on the sea-coast in site. Other sea-side cities are Rio de Janeiro, Recife and Habana among Latin America's million cities. Mexico City is now one of the world's largest cities, but its location as to hydrological conditions is quite unique, since it does not have a significant river nevertheless it is a very typical inland great city.

The Korean Peninsula has three large cities of this category. South Korea's Seoul is located inland on the Han River. But this river may not be a river big enough to be labeled as a river which satisfies the definition of river-side city in world perspective. Development of Inchon as an outer-port to Seoul may explain this fact. Pusan is a typical sea-coast city on the contrary. Pyongyang in North Korea is another river-side city, but the river there is too small to be so called in world perspective too. In this respect, the Korean Peninsula is more or less similar to China, rather than to Japan.

Of the 113 world's million cities as of 1978, 36 are to be labeled as sea-coast cities as shown in Table 1. In this case, New York with both locational conditions is also included. One may raise a question whether Tokyo, for example, should be regarded as a city with both sea-coast and river-side locations as in the case of New York, because Tokyo has the Sumida. But its urban development has seen a clear change from the river-side one during the feudal period to the sea-coast one in modern ages.

It is very interesting to note that the overwhelming majority of the sea-coast cities are bay-coast ones, but not all of them. Exceptions are Jakarta facing the Java Sea in Southeast Asia and Madras on the Bay of Bengal, in other words, the Indian Ocean. The two have man-made ports on the sea-coast. Several others have small bays only, scarcely providing bay space for the respective ports as in the case of Barcelona, Karachi, and perhaps Los Angeles. Lagos in Nigeria is located on a lagoon of the Bight of Benin, and so it could be labeled as a lake-side city too, if a lagoon is considered as a lake.

The examples from Japan are generally characterized by the dominance of sea-coast cities as already noted. Among the eight of this category, only Kita-Kyushu and Fukuoka are located around a relatively small bay, especially the former (Dokai-wan). All the other six are typical examples of bay-coast cities (wangan-toshi). Bays of Tokyo, Ise and Osaka provide the respective bay-coast cities with a sea (bay) space large enough or almost large enough to anchor many vessels and to install port and related facilities. As a result, Tokyo Bay with Ports of Yokohama, Tokyo, Chiba and Kawasaki is now the world's largest port in actuality, although they are not incorporated into one port authority as in the case of New

York Port Authority, Hampton Roads or San Francisco Bay Area.

Many of the world's million cities do not have similar physical conditions; rather the Japanese examples could be said to be exceptional.[4] Several cities may fall in the same category: Melbourne, Buenos Aires, Monte Video, New York, etc. If the San Francisco Bay Area is treated as a million city (its metropolitan population is far over a million), this is another typical example.[5] A similar recognition could be applied to Lisboa in Portugal for its having a large bay-like estuary of the Tejo.

Classification of the cities in terms of the hydrological conditions should await further consideration and analysis. Inclusion of smaller cities than million ones, perhaps those with a population of half a million or more, in this consideration may lead to a more accurate classification. With many more samples and with much more detailed locational appraisals, the cities of the world could be compared better. Definition of the term "bay-coast cities (wangan-toshi)" could, and should, be made after these considerations. In addition, considerations of distribution of the large cities in time sequence could unveil unknown facts regarding the hydrological locational conditions.

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