MURAMATSU LAB.

[Are cities friends of the earth?
looking megacities from global points of view]

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1.Megacities and the Global Environment

When we consider global environmental problems, cities are often deemed to be "perpetrators" that consume massive amounts of resources and generate various forms of waste. At present a large number of megacities with populations in excess of 10 million have emerged. Poverty and environmental deterioration are evident in these enormous cities, which are also extremely susceptible to the effects of global environmental problems.

We have commenced this Megacity Project in the Research Institute for Human and Nature (RIHN) since 2010 to find answers to questions such as *'Are cities friends of the environment?'*. As the main field of our research, we chose greater Jakarta, the capital of Indonesia. We propose the following steps to avoid the worst scenario about cities and the global environment.

1) Look at the past and present states of the cities from new angles.
2) Reveal the relations between megacities and global environment.
3) Make solutions not only by science technology but also suggestions from biological or historical features which the cities have.
4) Achieve the solutions as collaboration with not only specialists but also whole society.

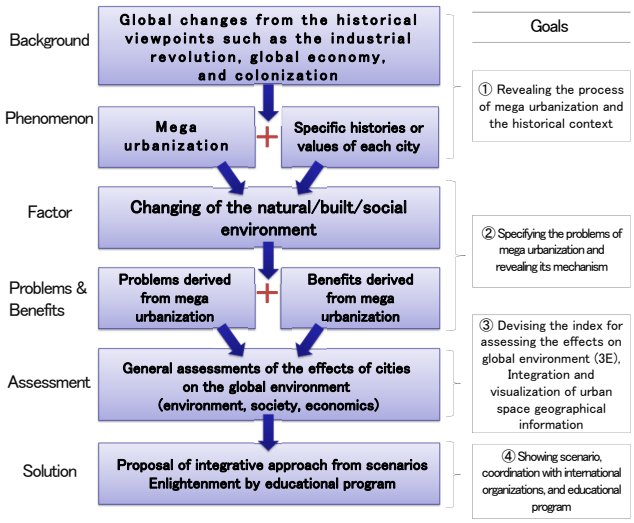

Table 1. Approach for solving problems

2.Measuring the sustainability

To be a friend of the earth, cities need to be not too much of a burden on the global environment and remain sustainable. To achieve this, without reducing economical and social performance to inacceptably low levels is a challenge. We devised the 'City Sustainable Index (CSI)' which is an index for measuring the sustainability of cities. It is used to understand the situations of cities and envision what cities should be in the future. Using CSI, we analyzed 18 megacities throughout the world and determined that not one of them presently qualifies as " a friend of the earth".

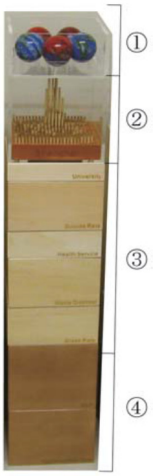

Photo 1. City Sustainable Index(CSI) ① When the city's impact on the environment is excessive, the globe above the model turns red. ② Distribution of a city's population density ③④ Performances of both social and economical aspects which relates to benefits from a city.

3.Maps tell us the memories

Knowing the transition of a city is essential to understand the past, present and future of the city. We have understood Jakarta's historical continuity by reviewing past maps of the city.

Photo 2. Maps of Jakarta in 1853, 1952, and 1990.(In the collection of Koninklijk Instituut voor de Tropen (1853) , National Library of Australia (1952), and BAKOSURTANAL(1990))

4.Design proposals for residential communities

Envisioning a better Jakarta in the future, we must make design proposals taking into consideration the climate and characteristics of the land where the city is located, and carefully examine the history of the city that has changed over the years. Looking at the expansion of Jakarta (a city that began developing during the colonial period of the 20th century) shows that there are many high-density residential areas on the outer fringes where many people of low income live. In the outer fringes where the city is also expanding, rice paddies and storage reservoirs are being filled in to make way for city development. We are currently proposing dwellings suitable for the characteristics of these areas.

Photo 3. Design proposal for high-density settlement in Jakarta.

Photo 4. Proposal for a rural residential area at the front line of urban expansion.