

Study on change of night-population, environmental load and municipal tax revenue after use conversion of large site for factories to apartment house and so on.

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[Synopsis]

In this study, we found good land use of 50 large sites in industrial city, which makes night-population (population) large and municipal tax revenue (tax) high and environmental load (SOx) low after use conversion, from big factories to such as large-scale use for apartment houses or retail store, or distribution facility, or small-scale use for apartment-houses, parking lot and so on and their combination by using genetic algorithms (350 genes) after defining this problem as non-linear inverse problem.

In trial D (maximization of population and tax), under restriction of 80% cap of gross floor area ratio, many of sites located at inland whose land prices are high are converted to large apartment houses. Number of such cases is 9 (limitation of conversion to large apartment houses are 10). At coastal area, in sites converted into only small site use, proportion of small apartment houses is high. In trial E, in addition to condition of trial D, SOx is minimized. In addition to inland large apartment houses, 2 sites are converted into apartment houses at coastal area. In both trials, increase of population are about 120 thousands.

In trial F (maximization of population and tax), in addition to condition of trial D, under restriction of tax 10 billion yen, it is same that many of inland sites are converted into large apartment houses, but in coastal area, sites where only small apartment houses are located increase. Both in trial D and E, such sites dotted coastal factories area. On the contrary to this, in trial F, such sites gather and are located side by side in center of coastal factories area. So there is little problem in such cases in developing residential area in comparison with trial D, E.

In trial G under restriction of tax 10 billion yen cap and 20 thousands employees and total floor area of retail use 30 thousands m² minimum (maximization of population and tax), in coastal area apartment houses are located less than trial D, E, F. So increase of population are about 10 thousands. In other words, on the point of population, trial G is less effective than D, E, F.