

A Study on Land-use Changes and Regulations in Industrial Zone

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In the last few decades, industrialization has led to the growth of cities, and large and mega-cities are appeared. In the early industrialization, skills and knowledge that were rooted in the community led to the entrepreneurship of small-scale manufacturing industries in diverse ways. The small-scale manufacturing industries began to accumulate in an area, as well as, the demand for industrial land use has increased, affected by a network effect (also called network externality). The rapid and un-planned accumulation of manufacturing industries has triggered urban sprawl and various problems in cities. Many urban studies attempted to explore appropriate countermeasures in order to minimize external diseconomies caused by the accumulation of manufacturing industries such as noise, congestion, and living environmental degradation. A zoning system that regulates the type of buildings to be erected in an area, called Land-Use Zones Area zoning was one of the effective solution. Early zoning system has been introduced three land uses - residential, commercial, and industrial, but the zoning system has been changed and fragmented by urban restructuring.

In 1968, the Japanese City Planning Law revised the zoning system by fragmenting into two industrial zones as "Quasi-industrial Districts" and "Exclusive Industrial Districts". Quasi-industrial districts were designated in order to improve the convenience and to protect small-scale manufacturing industries by inducing not only industrial use but also residential and commercial use, which has contributed greatly to the community development. Meanwhile, Exclusive Industrial Districts were designated in order to ensure the safety of the living environment by allocating a high-risk and large-scale factory and restricting residential land use.

In recent years, the manufacturing industries declined by de-industrialization and moved away from the urban areas due to the inflating of land prices and wages. Bell and post-industrial theorists advocated that service industry will fill a void in the decline of manufacturing industry thus the decline is not a problem in the society. The advance of transportation capability and the elimination of trade barriers between nations create new industrial environment. Traditional bid-rent theory and concentric zone model cannot explain current land use change where manufacturing industries move out from urban areas.

Manufacturing industries flight from urban areas is triggering land use change from the mixed uses of residential, commercial, and industrial uses to an exclusive residential or commercial use. This land use change causes the losses of local identity on manufacturing, place attachment and pride as a motivation of community development, local employment, and aging facilities. In order to overcome the problems, community-rooted manufacturing industry protection policy is necessary. As an example, there is a land use control regulation to restrict industrial land use in downtown by zoning

designation with consideration of local context. However, the land use control by zoning designation often does not work well. It can be said that the policy and urban planning theory for land use change by the decline of manufacturing industries in industrial zone has not been developed yet. Along with the analysis of land use change of manufacturing agglomerations, a theoretical study on urban planning system improvement is necessary.

Manufacturing industries' move-out from urban area and shut-down has been working to residentialization and commercialization in many industrial districts. In Exclusive Industrial Districts, a uniformity policy of land use is applied in order to improve living environment in the industrial land uses. On the other hand, the uniformity policy of land use is also applied to a manufacturing agglomeration where several land use are mixed and close to downtown, therefore large-scale apartments and commercial facilities are built. It induces a decline exacerbated the production conditions of the small manufacturers who have continued to produce in the job living close to the downtown, the production activities in close contact with the community in some cases.

In order to overcome the problem of land use change in a manufacturing agglomeration where several land use are mixed, it is necessary to revise zoning system identifying detail land use regulation and building use, as well as, to de-regulate the use for protecting local industries.

The aim of this study is to investigate the effectiveness of land use control based on zoning systems and urban regulations and to clarify the problems and reasons why the urban system and regulation is now working well in current land use change. For the purpose, this study carried out land use change analysis on manufacturing agglomerations in large cities in Japan and South Korea where uniformity policies for land use control are applied. By considering the problems in industrial zone, it will be able to gain knowledge about the city planning policy and theory to improve the activity of the industrial areas in both countries Japan and South Korea.