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LANDSCAPE AND URBAN PLANNING

ELSEVIER

TAMA NEW TOWN, WEST OF TOKYO: ANALYSIS OF A SHRINKING SUBURB

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TAMA NEW TOWN, WEST OF TOKYO: ANALYSIS OF A SHRINKING SUBURB.

Abstract: This paper aims at analyzing the process of urban shrinkage in the Japanese frame. It focuses on the case of Tama New town, developed at the end of the sixties 40 km West of Tokyo during a period of demographic boom. Nowadays, this ageing new town is representative of Tokyo's shrinking suburb. Criteria of shrinkage are defined and tested in Tama. Thus, it is possible to delimit a form of *retraction* or shrinkage characteristic of that kind of suburb. As a result, applied solutions are proposed, calling into question a model of urbanization (endless urban sprawl) and bringing to the fore new debates concerning reversibility and sustainability of town planning.

Key words: new town, suburb, ageing, shrinkage, planning, reversibility.

Introduction

The traditional Japanese urban model is currently undergoing major transformations. Large cities, which had been continuously sprawling, are now experiencing an adverse process, due to population's decline (Fujimasa, Furukawa, 2000) and ageing and sluggish land markets (Aveline, 2003, 2004). This began some years ago, but it is now reaching a critical point. It mostly concerns more distant suburbs. According to Yutaka Harada, chief economist at Daiwa Institute of Research Ltd., "a shrinking population will bring a better living environment for each individual in this small crowded country, including fewer commuters on rush-hour trains and greater residential space per person" (*The Japan Times*, January 1st, 2005). But at a local scale, it raises the question about the effects of urban shrinkage. A notable instance of this is the case of new towns like Kozoji New Town (20 km from Nagoya), Senri (30 km of Osaka), Tama New Town, (35 km West of Tokyo), etc. These new

towns were developed by metropolitan governments at the end of the 1960's, in a context of rapid economic and demographic growth, in order to prevent unplanned urbanization in the suburbs, endless urban sprawl, and to provide a large amount of housing with a good living environment (Homma, 1998). At present, these new towns are becoming old towns and concentrating declining suburbs' problems: massive population ageing and loss, convulsed neighbourhoods, buildings emptiness, landscape degradation, urban life erosion. This burning issue awaits detailed consideration by the full range of disciplines and professions concerned with cities. The reality of shrinking cities, an increasing phenomenon, has until very recently been overlooked. But research on this topic has been developing in the last five years, especially in Germany (Bontje 2005, Kabisch 2006, Löttscher, 2004, Müller 2003, Oswalt 2006, Weidner, 2004), and it is now possible to understand the impact of urban shrinkage and what strategies of urban transformation can be implemented.

The first part of this paper will provide a brief general outline of the shrinking process and of the Japanese case in particular. Then, we will focus on the case of Tama New Town, developed from 1967, 35 km West of Tokyo. We will try to demonstrate to what extent Tama New Town is representative of Japanese shrinking suburbs. As a result, this analysis provides an opportunity to clearly understand the phenomenon. Planning perspectives and propositions to solve this problem are addressed in the third and last part of the paper.

I) URBAN SHRINKAGE: INTERNATIONAL PERSPECTIVES

A- AN EMERGING PROCESS

Urban growth processes and their implications for urban form have been widely analysed. However, until recently, relatively little attention had been given to urban shrinkage, despite its significance at present in many parts of the world: Japan, Korea, Germany, Eastern Europe, United Kingdom, United States...(Oswalt, 2006). Now the issue starts to be studied

in details, especially in Germany where the process has already begun (cf references in the introduction). This helps to sharpen the definition. What does one mean by shrinkage? According to the *international shrinking cities project group*, it is characterized by “a sustained loss in population accompanied by symptoms of economic crisis²”. To avoid a confusion with counter-urbanization, migration beyond the municipal or metropolitan boundaries (Berry, 1976), a morphological criteria could be added. It seems that in European urban models, decreasing suburbanization is necessary to talk about shrinkage. Whereas counter-urbanization implies urban contraction on a local scale by the movement of people and employment away from large cities to places outside the cities, including small towns, villages and rural areas (Berry, 1976), urban shrinkage tends to involve a transfer of population towards centres. According to Müller and Siedentop (2004), in Germany, “as long ago as the mid-1990s, dynamic migration from cities to surrounding areas meant that population decline in core cities was more intensive than in peripheral rural areas. But since 1997 annual population decline in core cities has steadily eased, while not only rural areas nevertheless suburban communities are also shrinking”. For both authors, it raises an important question: “will suburbanisation and dispersion intensity continue to diminish under the specific conditions of demographic decline”? A number of large cities that had been extending their built-up areas over a very long period are now physically contracting, associated with, for example, industrial decline (Pallagst, 2005, Oswalt, 2006), population shrinkage (Fujimasa and Furukawa, 2000), sluggish land markets (Aveline and Ling-Hin, 2004) and political changes (Oswalt, 2006). The forces involved are sometimes acting in concert and sometimes independently. This process of contraction is liable to affect an increasing number of cities in the near future. The phenomenon of shrinkage seems to be a multidimensional and complex process (Pallagst, 2005).

² World Planning Schools Congress: Diversity and Multiplicity—A New Agenda for the World Planning Community. July 11–16, 2006. Palacio de Minería, Mexico City, Mexico.

B- THE JAPANESE CONTEXT

In Japan, the traditional urban model is currently undergoing major transformations. “In the postwar period, national and local governments in Japan made their spatial planning policies by assuming ever-growing socioeconomic conditions” (Feldhoff 2005). Until the beginning of the 1990’s, the traditional Japanese urban model was based on both demographic and economic expansion, which led to a huge urban sprawl. But important changes occurred: first, the end of the economic bubble and second, ageing and even population decline since 2005 (Ducom 2007). That is part of the second demographic transition (Van de Kaa, 2002). If the current fertility rate remains (1,24), demographic projections claim that the Japanese population could fall from 127 millions under 100 millions in 2038³. Figure 1 illustrates this changing demographic structure. Until recently, the problem of aging and shrinking population was highly present in the countryside. But many urban areas are now facing the same situation. It is new, but according to demographic projections, the trend should last. As a spatial consequence, large cities, which had been continuously sprawling, are now experiencing an adverse process (Flüchter, 2006, Fujii, Yasuyuki, 2006). Even in Tokyo itself, which is still slowly growing (figure 2), remote suburbs are almost not growing any more, whereas the city centre’s population, which had been continuously decreasing since the 1970’s, is now increasing. At very local scales, some areas included in more distant suburbs are now already losing residents (Ducom and Yokohari, 2006). There seems to be a transfer of population towards the city centre, which is currently being ‘densified’ by private developers, encouraged by the law on urban renewal of 2002. Several districts, like Shiodome in Minato-Ku (central Tokyo, figure 3), have recently been transformed from railway terminals to skyscraper districts of offices, hotels, restaurants, shops and luxury housing. Such projects, supported by Tokyo metropolitan government, widen the gap

³ Source : Japanese National Institute of Population and Social Security Research

between increasingly powerful and compact centres and declining peripheries (Aveline, 2003). Is this “more than a short-term, cyclical interruption of an enduring deconcentration process”? Will demographic shrinkage “diminish suburbanisation”? (Müller, 2003). Despite the deepening problem, planning practitioners continue to concentrate their energy on managing urban renewal and redeveloping city centres, thus exacerbating the problems of distant suburbs.

Tama New Town is a typical example of these remote declining suburbs. It illustrates the challenges faced by individuals and organizations, in both the public and private sectors, in addressing the consequences of shrinkage.

II) THE PARADOX OF “AN OLD NEW TOWN”

A- OUTLINE OF TAMA NEW TOWN PROJECT

Tama New Town is located in the Southwestern part of Tokyo, at a distance of 35 km from Tokyo Station (figure 4). It is connected to Shinjuku, one of the major business areas in Tokyo, by to railways. The new town has an East-West length of 14 km and a North-South width of 2 to 4 km. Around 1960, the demographic boom, the sharp rise of land prices and the high housing demand in Tokyo led to an important urban sprawl. To prevent further random developments and unplanned urbanization in the suburbs, and to supply a large amount of housing offering a good living environment, Tokyo Metropolitan Government set up Tama New Town project in 1965. The new town is straddling the municipalities of Tama, Hachioji, Inagi and Machida. As illustrated in table 1, three public organizations carried out the project: Tokyo Metropolitan Government, the Tokyo Metropolitan Housing Supply Corporation (TMHSC: a Tokyo Metropolitan Governmental agency for housing supply) and the Japan Housing Corporation (JHC: a national agency for housing supply) which became the Housing

and Urban Development Corporation (HUD, a national agency established in 1981 through integration of the JHC), and then the Urban Renaissance Agency (UR, a national agency established in 2004 by integration of former HUD). The new town was divided into two types of areas: new residential development programs on hills, and land readjustment programs in valleys.

The new residential development program areas were divided into 21 neighbourhood units. Each unit consisted in 100 ha containing 3000 to 5000 dwellings supposed to host 12000 to 20000 people, two elementary and one secondary schools, neighbourhood centres with stores and facilities along pedestrianized streets. In 1971, the first housing estates of Tama New Town opened in Suwa and Nagayama districts. Many *danchi* were developed (figures 5-6: standardized apartments buildings with five stories, parallel located). Each dwelling unit of around 50 m² consists of two or three rooms and a dining room with a kitchen (2DK, 3DK). In 1975, the number of supplied houses per year reached a peak. In contrast, JHC mass housing began to lose popularity, being judged remote from Tokyo, expensive and small. From 1975 to 1985, new types of multiple dwelling housing were sought. At the end of the 1980's, under the asset-inflated bubble economy, high density housing complexes were built by the Tokyo Metropolitan Housing Supply Corporation and the Housing and Urban Development Corporation. Eventually, after the bubble economy in the 1990's, the land prices decline and the redevelopment projects in central Tokyo have caused the return of population into central Tokyo and the unpopularity of old housing remote from stations in Tama New Town. The private sector took over supply of owner-occupied housing in Tama New Town from public sector, and in 2000, Tokyo Metropolitan Government and the Urban Renaissance Agency declared completion of Tama New Town development project. The evolution of land

prices in the new town from the beginning (figure 7) illustrates these changes: after reaching a peak in 1994, the prices have decreased until now.

B- CURRENT DEMOGRAPHIC SITUATION

Tama New Town's population is now rapidly ageing, faster actually than the national average (Doteuchi, Shiraishi, 1998). Fewer children are being born and beside, fewer young couples have settled in Tama New Town. Table 1 shows that the formerly projected population of 342200 people is far from having been reached. According to Tama Development Office, Tama New Town had 201443 inhabitants in 2004, hardly 60% of the projected population. Of noticeable interest is that the population is not evolving equally in the whole new town. It is striking that the units of early development are the most declining. Tama City for instance, chore of the new town's development, roughly 70 percent of whose population lives in Tama New Town, peaked at 145,677 inhabitants in 1994 before sliding to 141,180 as of 2002, whereas Inagi or Hachioji population were still growing (figure 8). In areas such as South of Nagayama Station, developed at the beginning of the 1970's, where newcomers massively belonged to a similar age group, residents have massively grown old (25% of residents are more than 65 years old). As illustrated on figure 9, the population distribution by age can be very different from one district to another. In the area of Wakabadai, developed in the late 1990's, most of the population is between 30 and 44 years old, whereas in Toyogaoka, developed in the early 1970's, most of the residents are between 50 and 69 years old. Last but not least, the family structure is changing. In 1991, the average number of family members per dwelling unit was 2.9, and 2.3 in 2004. When people moved in, there used to be children everywhere. Tama was a lively place. But the number of pupils at Tama's public schools has

halved from a peak of 16,779 in 1988 to 7,487 in 2002, leading local authorities to close six out of 37 schools over the past decade. According to the National Institute of Population and Social Security Research, the percentage of elderly people (at least 65 years old) could reach 70% in some districts in 2030. The new town, once the symbol of a rising Japan, now represents a population in decline. This situation has of course important implications in terms of spatial organization.

C- A REPRESENTATIVE CASE STUDY

These demographic trends and sluggish housing market are key features of decline. They imply spatial impacts including more and more vacancies, emerging social problems, abandoned facilities, landscape degradation. This special pattern of shrinkage essentially due to demographic decline is not specific to Tama New Town, which is rather typical and representative of what is happening in that kind of remote suburb, as illustrated on figure 2. Indeed, if we check different criteria such as demographic statistics, landscape evolution, land-use, perceptions, then we understand that similar schemes are occurring all around Japan.

We conducted a detailed follow-up in Tama New Town by data (statistics, photos, maps, interviews) and methodologies crossing. Elements of urban life erosion are the first indications of shrinkage in Tama. The neighbourhood centres in the units of early development are declining. Concerning housing, according to the Nagayama danchi information centre, the rate of vacancy in rented apartments can reach 20%. This phenomenon massively concentrates in the apartments built in 1971 (figures 10-11). It is obvious that these apartments don't correspond to current aspirations any more. Many young couples are no longer interested in old apartment units with small rooms built on earlier standards. In the

same way, small shops located on first floors of buildings, along pedestrianized streets, don't attract visitors any more. They are deserted, being judged to small, old-fashioned and hardly accessible by car or train. Bigger malls are preferred. As a result, these small neighbourhood shops are closing one after another (figure 12). According to Tama City Development Office, the vacancy rate of first floor shops reached 30% in 2004. In terms of perception, interviews conducted by the author by local population in Tama (Ducom, 2006) stress a strong feeling of loneliness and desertion. The expression "ghost city" was often pronounced to describe the new town's atmosphere nowadays. Residents suffer from a lack of social interaction; they don't feel themselves as members of a community. The inhabitants also seem to have felt abandoned by local authorities since Tokyo Metropolitan Government and the Urban Renaissance Agency declared completion of Tama New Town development project, leaving further developments in the hands of the private sector. It recalls the "simulation city" described by Yatsuka (1994).

Landscape constitutes the most obvious indicator of change. A degradation is detectable. The comparison of figures 5-6 and figures 10-11 underlines that *danchi* have grown old and look unattractive. In addition, abandoned elements lead to the construction of the "ghost city" image: closed schools for lack of pupils (figure 13), abandoned playgrounds for lack of children (figures 14-15). A place might be shrinking when its image, in terms of perception, is shrinking... Beside, some planning concept now avoid accessibilities to basic services and amenities. For example, the principle of separation of cars and pedestrianized streets contributes to important accessibility problems. Highways are located in the valleys and pedestrianized streets on the hills (figures 16-17). As a result, elderly people encounter more and more difficulties to move through the new town. Pedestrianized streets become

underused, often empty. Along them, the last free parcels don't interest developers any more and vegetation is claiming back land (figures 18 to 20). A study of similar un-urbanized housing land developments in the new town of Tsukuba (North East of Tokyo) was conducted by Yoshida (2003). To understand if this landscape slow degradation reflects deeper spatial transformations, it is necessary to analyse the land use. We conducted a follow up of Tama New Town land use from 1991 to 2002, using geographical information systems (*Arcgis*) with Tokyo Metropolitan Government digital data. Figure 21 represents the evolution of land use, with three different categories: residential sectors, public and private equipments (public equipments such as schools, halls, hospital... and private equipments such as offices, industries, shops...), open spaces (parks, playgrounds, agricultural land, brownfields). Residential sectors have considerably expanded, which is not surprising for a dormitory settlement. What is striking is that the open spaces category has retracted through time. Fallow lands have been replaced by residential developments. In terms of land occupation, it would be inaccurate to speak about urban contraction, at least until 2002. Nevertheless, developments essentially expanded between 1991 and 1996. Between 1996 and 2002, it is interesting to notice that expansion slows down. It illustrates a decrease of pressure for land occupation in this area. Since the data are approximately updated every sixth year, the next ones should be available around 2008 and should cast new light on shrinking processes. After the relative stagnation observed between 1996 and 2002 in terms of land use, the last period might be the scene of spatial retraction of suburban settlements (demolitions of empty buildings, closed schools, etc...). This phenomenon of *disurbanization*, "Rückbau" in German, has already taken place in certain cities of Eastern Germany (Bontje 2005, Pallagst 2005, Siedentop and Kausch, 2004). It would mean that shrinkage first occurs with population decline, urban life erosion, and then physically and spatially, with urban contraction.

Several conclusions can be drawn from these observations. First, the shrinkage observed in Tama is of a particular kind. On the contrary of the “classical” shrinking cities general pattern in the world, where industrial production and investment moved elsewhere, leading to characteristic inactive factories and brownfields, Tama New Town “only” suffers from ageing. Therefore, it looks like a dormitory settlement slowly emptying of its social contents. Along landscape lines, it shows itself selectively, at a microscale. Second, the time-lag between social and physical modifications reflects a phenomenon of inertia, in other words a dichotomy between the container and the contents. In this regard, physical urban contraction might constitute the last step of urban shrinkage. This point has to be checked and dealt with. Third, this specific Japanese way of urban shrinkage of which Tama New Town is representative can be explained by the gap between former needs (to answer to which the new town was developed) and current needs, a growing inadequacy between obsolete urban forms and changing aspirations (for example, oversizing educational services, undersizing health and elder car services). Put simply, there are hardly any newcomers since it is now possible to find better options of housing nearer from Tokyo centre. Tama New Town can have been an optimum residential solution in a particular context, which is not the case any more. Fourth, Japanese distant suburbs currently experience a very classical situation: they were brought into existence relatively recently during mounting pressure on land, and they are proving to be the first to be abandoned as pressure decreases. (Flüchter, 2005). General geographical models of settlement and desertion have been developed, not only for urban studies (Ducom, 2003). But The transition from urban sprawl to urban shrinkage raises questions about the sustainability and reversibility of urban developments and about the appropriateness of the traditional urban model and its capacity for adaptation.

III) SOLUTIONS AND NEW DEBATES

A- CALLING INTO QUESTION A MODEL OF URBANIZATION

This new situation calls into question the traditional Japanese model of urbanization, based on economic and demographic expansion, and which created endless urban sprawl of mass housing for people who could not afford to settle near the city centre and who were ready to commute several hours a day between home and work. This model has been criticized for a few years now (Tanabe, 1991, Doteuchi, 1998, see also the movie *Pompoko*). Obviously, in view of the shrinking cities phenomena, some planning concepts need revision. It is for example amazing to see how little consideration was given to new residents' aging in the future, especially in terms of accessibility: medium-rise buildings with no elevators and hilly landscape of Tama New Town are now challenging elderly people. But all these elements could have been taken in account from the beginning in a more long-term view. That is the principle of sustainability. Indeed, in terms of demography, projections can be reliable. Therefore, new towns, which might have constituted the solution at a time, could have been planned in a more reversible way. A notable and applied instance of this is the case of a school built in Tama in order to be transformable into an elderly people's home, which it became in 2005, after the school closed. As a product of cycles of development and desertion, new towns could have been considered and planned as transient, reversible settlements. The increasing part of elderly now generates demand for new kind of urban services like transportation, medical assistance, adapted housing, leisure. It raises the question of accommodating specifically for elderly people (Pihet, 2006). The risk is to produce segregated retirement communities. This trend implies that the population will decrease in the near future. At that moment, authorities will have to face abandoned and empty urban territories. The challenge Tama New Town has now to face is to adapt the urban spatial structure so as to accommodate new specific needs due to changes in the population structure. Adaptations can be of many kinds. Concerning existing structures, light modifications such as installing elevators in *danchi* (95% of which are not equipped for the moment) could be easily

implemented. The use of closed schools for new functions such as community centres is also a solution already successfully implemented in Tama New Town. But in terms of governance, who should do what? Public and private initiatives are articulated. In Tama New Town, Non Profit Organizations (NPO) are the key-actors playing a major role in the adaptation process (Bothwell, 2003). 40% of the existing NPO deal with the problem of accessibility by offering alternative and light transit systems. Other NPO operate as day-care service centres. The *Fukushitei* for example, situated in one of the first floor ancient shops along the pedestrianized street in Nagayama district, welcomes everyday around 40 elderly people, all living in the neighbourhood, and often clients and volunteers at the same time. Medical meals and services are provided. Beside, people can enjoy an atmosphere of community.

B- GROWTH VERSUS SHRINKAGE: A NEW PARADIGM

Local authorities have recognised the importance of the issue, but there is little consensus on policy. An international workshop was organised in 2006 by Tokyo Metropolitan University and the 4-MET centre to deal with the specific problems of in Tama New Town. It is obvious that completely novel action is required. However, there is a curious failure to acknowledge the situation and the implications of projections of declining populations. When the issue is broached, it is only to debate about reversing the process, in order to achieving growth. For example, the first strategy elaborated by local authorities is the adoption of measures to support child-raising households, including dispatching helpers for pregnant women and households with infants, but there is no reversing effect for the moment. Other example: in Tsukuba (another new town, 60 km North East of Tokyo), a development project is planned to host 80000 new comers by 2030, even if the housing demand has already started decreasing... (Yoshida, 2003). Of course, these solutions are less and less appropriate to the new challenges. Wrong solutions are chosen because of a firm belief

in the short-term nature of shrinkage and the expectation that the “natural state” of growth will return. Whereas in Germany, authorities have already implemented several responses to shrinkage (Weidner, 2003), with the concept of *Rückbau*, in Japan, it is as if growth was the “normal” situation. Despite the extent of the problem, planning practice continues to concentrate on managing urban renewal and redevelopment of the city centre, thus exacerbating the problems of distant suburbs. There is a curious failure to acknowledge the implications of projections of declining populations. But as underlined by Müller (2004) “fundamental rethinking is required. Growth-oriented approaches must be paralleled by a “decline paradigm”. It is less a question of what infrastructure should be provided than how and under what conditions infrastructure systems can be maintained or have to be redesigned”. Will demolition of substantial portions of the housing stock form the only possible to avoid the appearance of “ghost towns” in Tama? Who will finance this? Again, the question of governance is raised.

The phenomenon of shrinkage is discontinuous and comprises fragmented areas. Therefore, it has to be taken in account at a global and local scale at the same time. Suburban shrinkage and downsizing address the scale of metropolitan regions and requires policy-makers to “redefine traditional paths of regional governance” (Pallagst, 2005).

Conclusion:

In the light of international research, we demonstrated a specific type of shrinkage due to population aging and decrease. If conclusions in terms of land use are still limited to stress spatial urban contraction, it is obvious that shrinkage has started in Japanese distant suburbs. The transition from urban sprawl to urban shrinkage raises after-sprawl planning perspectives. It questions the sustainability and reversibility of urban developments and the appropriateness of the traditional urban model and its capacity for adaptation. The way the Japanese urban society will face this dramatic situation should give Japan a leading role in terms of

challenging population ageing and shrinkage and the spatial implications. As Feldhoff (2005) asks, “wether new forms of bottom-up urban and regional governance instead of top-down urban and regional planning will be born out of the ongoing changes is a question that has yet to be answered”. Population decline can also be considered as an opportunity in high density areas. The problematic in such shrinking suburbs is indeed quite different from the one in desert regions, where the alternative is maintain or abandonment of services, structures, general environment. Here, on the contrary, it can be the moment to rethink urban design and quality improvement (new open spaces, new green areas...), mobilizing endogenous resources. Many scenario have already been thought (Ducom, Yokohari, 2006). Some of them sound realistic, others very utopian. Nevertheless, they prove that in a way, shrinkage can represent a chance for acting.

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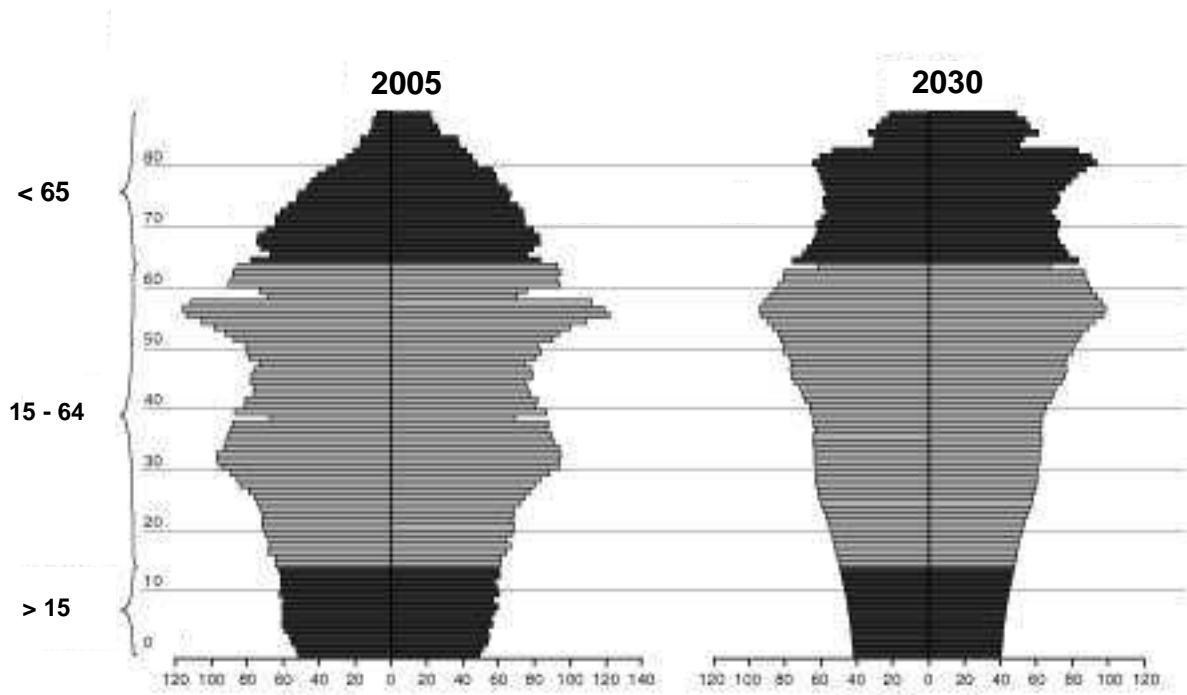
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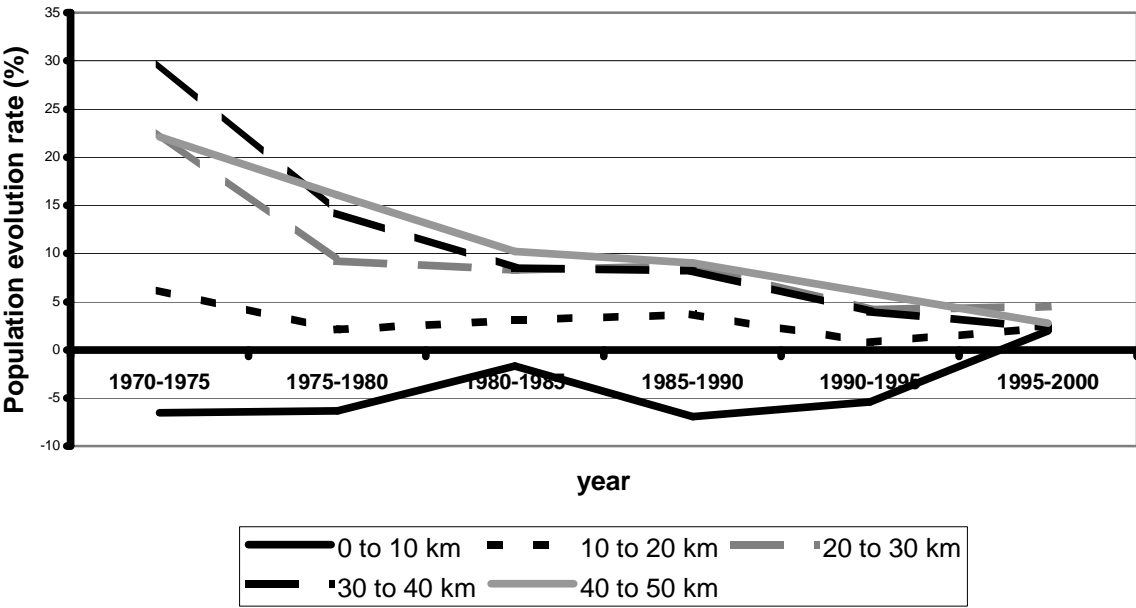
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figure 1 : age pyramids 2005, 2030, Japan



Source : www.stat.go.jp

Figure 2 : Evolution of Tokyo metropolitan population according to the distance to Tokyo center



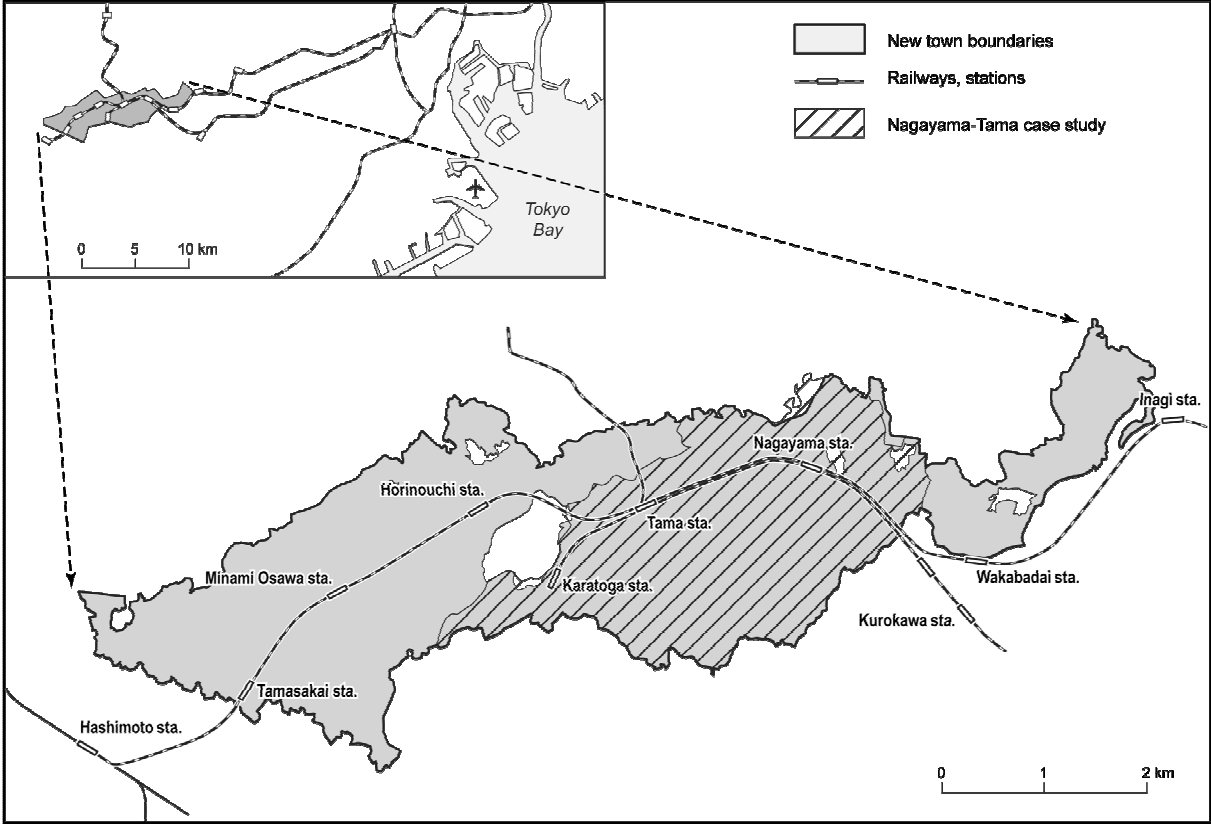
Source : Tokyo Statistical Yearbook, National Institute of Population and Security Research.

Figure 3: Shiodome



Source: author

Figure 4: Tama New Town



Source: Author + V. Lahaye.

Table 1: Tama New Town development project

	Surface in ha	Projected population (1967)	Population in 2004	Number of housing units in 2004
New Residential Program	2217.4	282000	151806	55007
* Tokyo Metropolitan government	738.4	96800	47927	17204
* TMHSC	49.7	10500	6082	2372
* JHC, HUD, UR	1429.3	174700	97797	35431
Land readjustment Program	666.5	60200	49637	23697
Total	2883.9	342200	201443	78704

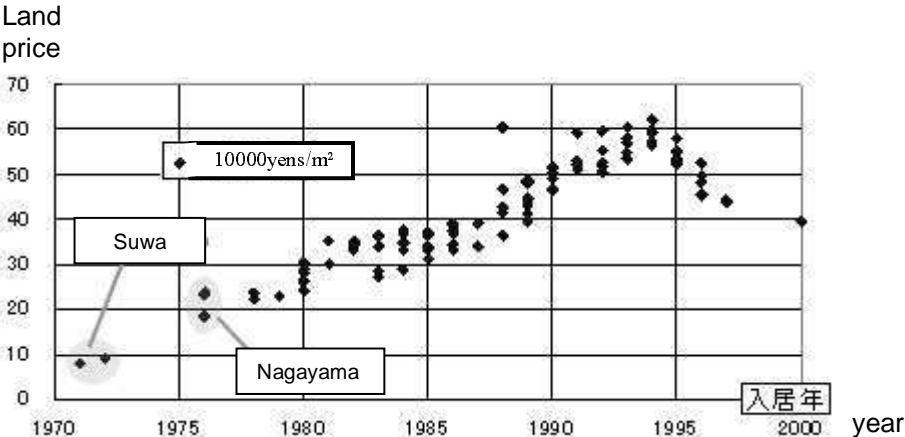
Source: Urban Renaissance Agency.

Figures 5-6: *Danchi*, Nagayama district, 1971



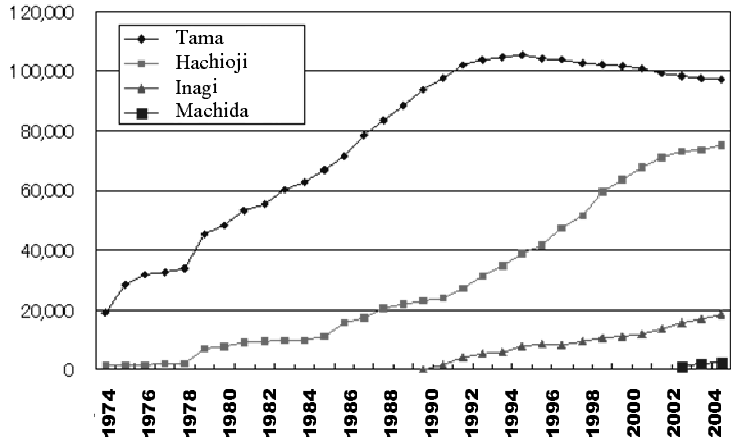
Source : Tama New Town Digital Library .

Figure 7: Land prices evolution in Tama New Town from 1971 to 2000



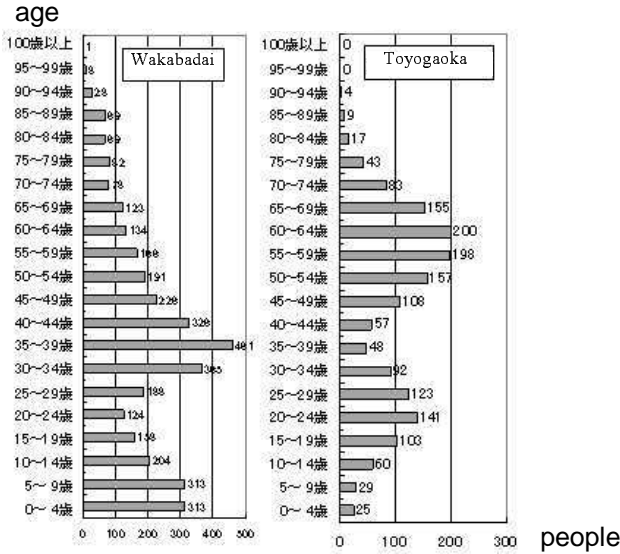
Source : www.machisen.net.

Figure 8: Population distribution in Tama New Town



Source : www.machisen.net.

Figure 9: Population structure in Wakabadai and Toyogaoka



Source : www.machisen.net.

Figures 10-11 : Old *danchi*, Nagayama district, 2006.



Source: author

Figures 12: Closed shops along the pedestrianized streets, Nagayama district, 2005.



Source: author

Figures 13: Closed school, Tama New Town, 2005



Source: author

Figures 14-15: Abandoned playground, Tama New Town, 2005



Source: author

Figures 16-17: difficult accessibility for elderly through pedestrianized streets. Tama New Town, 2005



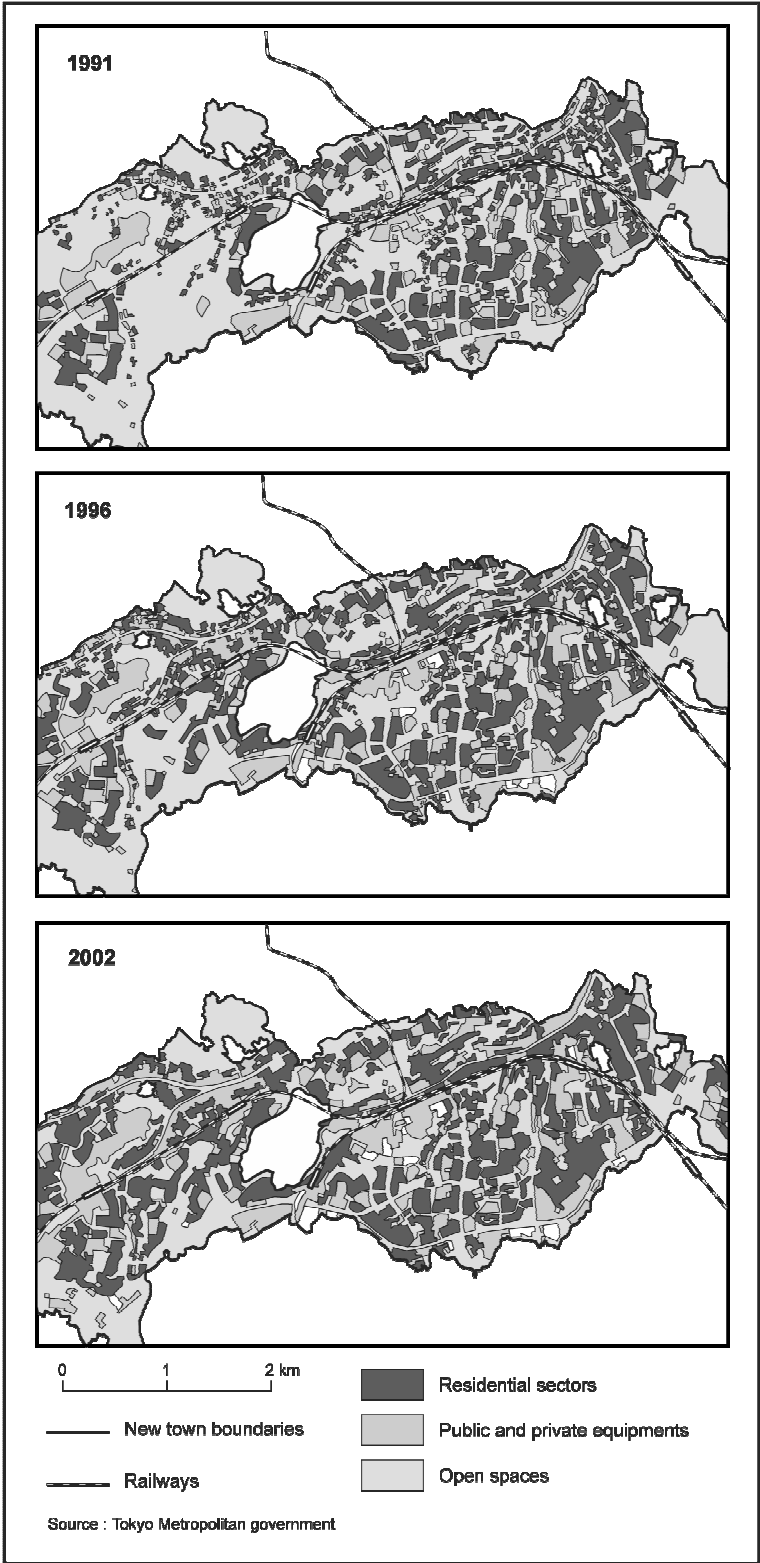
Source: author

Figures 18-19-20: Undeveloped parcel of land along the pedestrianized streets, Tama New Town, 2005



Source: author

Figure 21: Land use evolution in Tama New Town from 1991 to 2002.



Source: author + V. Lahaye