Interactions between coastal urban dynamics and agricultural areas of the Cote d'Azur: stakes and processes

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INTERACTIONS BETWEEN COASTAL URBAN DYNAMICS AND AGRICULTURAL AREAS OF THE COTE D'AZUR: STAKES AND PROCESSES

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Abstract

On the Côte d'Azur, agricultural areas are major components of the landscape's beauty and contribute to tourism and residential development. However, the desire to take advantage of environmental assets leads to an intense urbanisation of agricultural areas and a degradation of the local landscape. This paper analyses the land use changes observed over the last 40 years, of a strip stretching 10 km from the coast. Urbanisation has been progressing inland, to the detriment of agricultural areas. The objective is to understand the processes at stake and to think about the future territorial evolutions, with a particular attention paid to systemic interactions and the spatial dynamics resulting from them.

Introduction

For many decades, Mediterranean coasts have been subjected to a process of littoralisation, which acts with more or less intensity depending on the regions. The densification of human occupation comes along with an increasing artificialisation whose environmental damages are well known. Urban sprawl, to the detriment of agricultural and natural areas, is the topic of several studies. However, few studies have focused on the spatial dynamics resulting from the interactions between agriculture, urbanisation, landscape and distance from the shore. These dynamics have become complex, particularly in the coastal regions with a high attractivity. Their understanding is fundamental for a sustainable planning and development of coastal regions. This paper studies the linked dynamics of agricultural and built-up areas, over the last forty years on the Côte d'Azur. The complex evolution of this region prefigures the dynamics of numerous coastal regions subjected to a strong land pressure. The objective is to understand the processes at stake and to think about the future territorial evolutions, with a particular attention paid to systemic interactions and the spatial dynamics resulting from them.

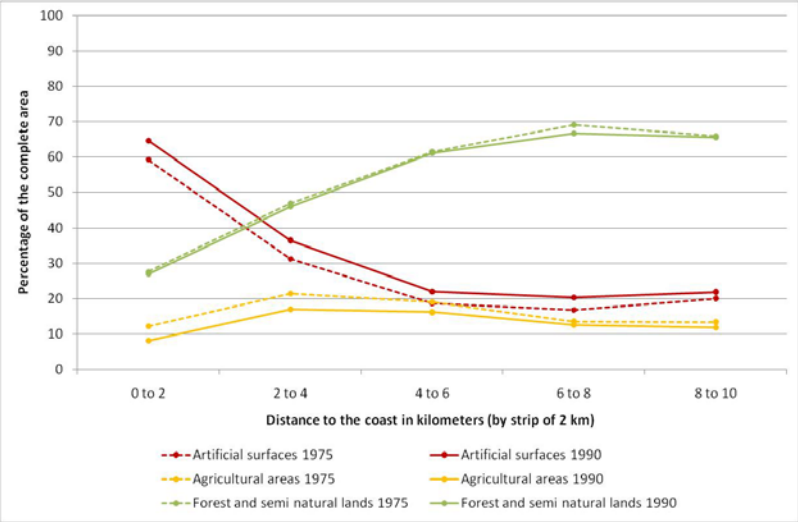
1 Evolution of agricultural areas and built-up surfaces on the Côte d'Azur

The image of the Côte d'Azur is strongly linked to certain agricultural specialisations, principally flowers, but also citrus fruits and olive trees (Boyer M., 2002). Flowers, along with palm trees and exotic vegetation, are inseparable from the symbolic landscapes of Côte d'Azur. At the beginning of the last century, this region was covered with fields of flowers. Around Grasse and Vence, scented flowers were cultivated to make perfume. The coastal plain of Vallauris and Antibes was covered with orange tree flowers which were intended for the perfumeries of Grasse. The coast and the first hills located between Antibes and Nice were specialised in cut flowers. Rose and carnations were sent all over the world. The 1950s marked the peak of horticulture on the Côte d'Azur: the turnover of horticulture equaled the turnover of tourism at that time. As time has gone by, horticultural areas, as citrus fruits, vines and vegetables ones have been gradually replaced by urbanisation growth. This evolution has accelerated since 1975. Thus, between 1979 and 2000, the municipalities located less

than 10 km from the coast lost 70 % of their vegetables surfaces, and 35% of their surfaces of vines and flowers. Only 50 ha of vines with a guarantee of origin remained. Surfaces in olive trees showed a higher level of resistance, with only a 15% diminution.

The result of this evolution is illustrated in figure 1A, which represents the state of land use in 2000, on a 10 km strip from the shore. Artificial surfaces spread along the coast and then widely penetrate inland, except in the eastern part because of the constraints of relief. Natural areas cover the major part of the hinterland. Agricultural areas are located between both, mainly in the Siagne valley in the northwest of Cannes, in the Var valley to the west of Nice, in the Nice hills and in the Menton hinterland. The coastal strip located between Cannes and Nice possesses almost no agricultural areas any more. On this portion of the coast, formerly highly agricultural, the creation of residential zones resulted in the disappearance of horticulture. Figure 1B shows agricultural areas which were urbanised between 1975 and 2000. The hills around Nice and the Var valley were the most extensively affected by the artificialisation of agricultural areas. The agricultural plots in the close hinterland from Vence to Grasse were not spared. All in all, more than 31 000 ha, or almost half of the agricultural areas of 1975, became artificial spaces during this period. New agricultural areas were scarce and couldn't compensate for the lost surfaces.

The decrease of agricultural areas in the Mediterranean coastal regions, resulting from the combined action of tourism and urbanisation, is described in numerous studies (DATAR, 2004 ; Plan Bleu, 2005 ; CNASEA, 2005). Rarer are the analyses which emphasise the spatial aspects of these processes. Such is the case of the study led by the Plan Bleu on the *Suivi de l'évolution du littoral à partir des données LACOAST* (2000), where the analysis of land use is carried out according to the distance from the coast. The distance is taken into account by means of five strips of 2 km wide, parallel to the coastline. On graphs 1 and 2, the percentages taken by each of the three classes within each strip are represented in the middle of the strips and linked. It may suggest a regular gradient, while in fact it is a mean value per strip.



Graph. 1. Land use of the Alpes-Maritimes coast according to the distance from the shore (1975-1990)

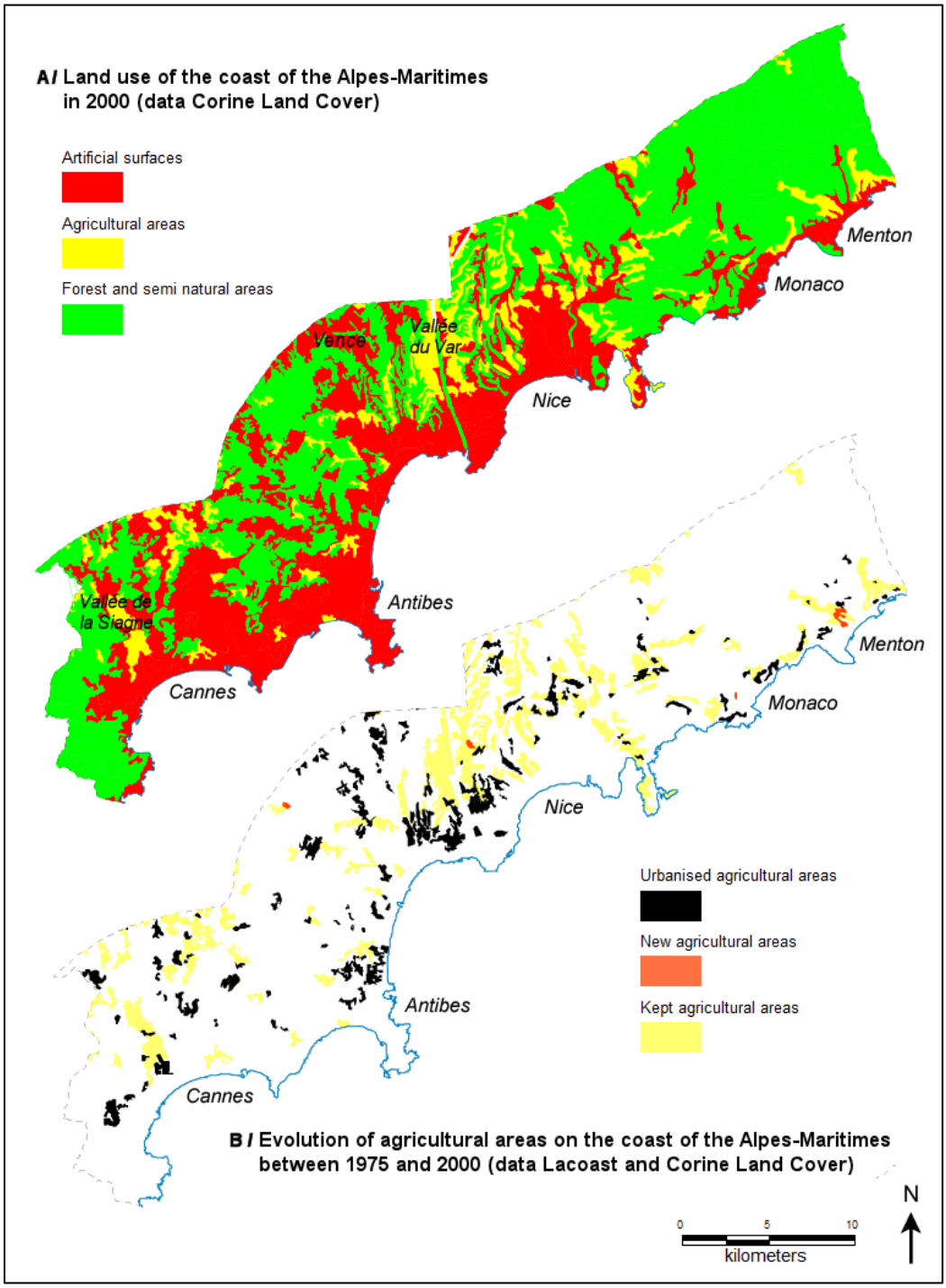
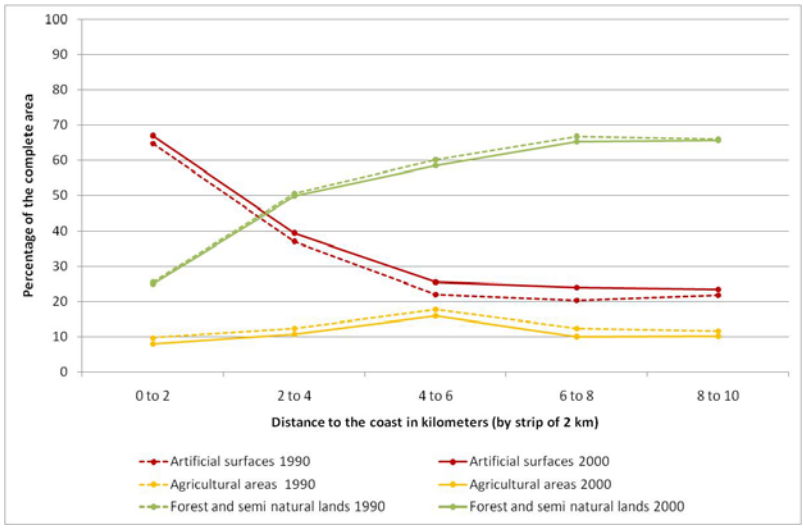


Fig. 1. Land use of the Alpes-Maritimes coast in 2000 and evolution of agricultural areas on the Alpes-Maritimes coast between 1975 and 2000

Artificial surfaces constitute the major type of occupation on the 0-2 km strip, with more than 60% of land. This part quickly decreases in the following strips but never falls below 20%. Between 1975 and 1990, the part of artificial surfaces increases in the five strips and more particularly near the shore. It is in the 0 and 2 km strip where agriculture is the least present. The decrease of agricultural surfaces is particularly strong on the first two strips, then it reduces. It is interesting to draw a parallel between this evolution and the one of artificial surfaces. The growth of artificial surfaces in the first 6 kilometers is clearly made at the expense of the agricultural areas. We have prolonged the analysis by carrying out the same treatment with the data Corine Land Cover 1990 and 2000 (graph 2). The artificialisation has taken place on the whole area of study, but the 0-2 km strip seems to have reached a threshold of

saturation. It is currently between 6 and 8 km from the coast that artificialisation has the strongest intensity. The proportion of agricultural and natural surfaces declined slightly in the first 2 kilometers and a little more on the last kilometers.



Graph. 2. Land use of the Alpes-Maritimes coast according to the distance to the shore (1990-2000)

During the period 1999-2006, treatments were carried out on the database, Land Use PACA (CRIGE PACA). The represented minimal surface is from 2.5 to 5 hectares while it is 25 ha for the data LACOAST and Corine Land Cover. Because of this difference of resolution, the obtained values must be compared with caution to the previous ones. It seems nevertheless that the tendency, although very slow, remains negative for the evolution of agricultural and natural areas, and positive for artificial surfaces.

2 Understanding the processes

The relationships which connect coastal agricultural areas and artificial areas are narrow. As time passed, they changed nature and became more complex. Three periods characterise these interrelations.

- Firstly, tourism and urbanisation development goes together with coastal agriculture. The need engendered by the economy of holiday resorts, population growth, plains planning and coastal rivers embanking encouraged the extension of vegetable and floral cultivation. Until the middle of the XXth century, urbanisation and agriculture grew on the coast in a concomitant way and without conflict because space was available.
- From the 1970s, horticulture underwent foreign competition, and the farmers in trouble stopped their activity all the more easily as real estate developers solicited them. Population growth accelerates and built-up areas spread. Along the coast, built-up areas combined little by little and once the interstitial spaces were filled, urban sprawling went inland. The "Loi Littoral" was promulgated in 1986 to contain the coastal urbanisation and to protect natural areas.
- With the end of the 90s starts the third period. The conflicts of uses increased with the rarefaction of available areas and caused the accelerated disappearance of farmlands. Authorities, at the national level and in a lesser measure, at the local level, became aware of the misdeeds of this evolution. New laws were promulgated at the beginning of the 2000s to limit the urban sprawling. In the *Alpes-Maritimes*, the objective for the “Directive Territoriale d’Aménagement” (DTA), developed in 2003, was to clarify the fundamental orientations in territorial planning. For the coast, it attempted especially to

determine the modalities of enforcement of the “Loi Littoral”. The attention is mainly focused on the urbanisation control and the preservation of natural sites. As regards farmlands, the DTA simply recognises that agricultural activities are in periurban context and that "besides their economic function, they play a role in the landscapes protection, the urban sprawl control and the natural risks prevention". It also defines geographical areas where agricultural activities must be protected.

In a geographical context, a set of factors contributes to the decrease of coastal agricultural areas. Agricultural areas of the coastal strip accumulate a double handicap. On one hand, as all periurban farmlands, they undergo the effects of the continuous urbanisation spread. On the other hand, they belong to an extremely attractive region where available areas for housing are scarce. Farmlands are potential land reserves. Land speculation increases the price of agricultural land to record levels. Today, the average price exceeds 300,000 euro/ha, which is prohibitive for farmers who wish to settle down or to purchase new land. The strong land pressure moves towards the close hinterland. The coastal subsystem reaches an advanced stage of littoralisation which appears through phenomena of saturation and diseconomies of built-up areas. The availability and the price of land, more affordable in the hinterland, encourages more and more city-dwellers to live there. The closer hinterland is henceforth included in the dynamics of the coastal subsystem and its spatial and functional structures have seen profound transformations (Voiron-Canicio Ch., 2006).

In view of this situation, local authorities and the State have neglected, by indifference or due to a lack of clear-sightedness, the destiny of the Côte d'Azur agriculture, unlike in the nearby Ligurie where for more than 20 years, the town councils of the Riviera have had a strict policy of preservation of agricultural and natural sites. By a limited number of granted building permits, they succeeded in containing urbanisation and keeping agricultural activity on the Ligurie coast.

Moreover, agricultural areas on French coasts have not benefited from the same protective measures as the natural areas. The “Loi Littoral” was promulgated at the same time as the “Loi Montagne”. For the latter one, the conservation of agricultural activities is one of the first objectives. As a consequence, legal measures are taken while the “Loi Littoral” only recommends "the preservation or the development of agricultural activities". Finally, the “Loi Littoral” had perverse effects (Daligaux J., 2001). By slowing down the artificialisation of the coast, it repelled the land pressure on the farmlands of the coastal zone and the hinterland.

The individual strategy of the farmers is added to these factors (Jouve A-M., Napoléone C., 2003, pp. 143-171.). The uncultivated areas are relatively numerous while there is need for farmland. This paradox is explained by the fact that certain farmers are tempted to sell their lands to promoters who anticipate the changes of zoning, purchase this land and leave them uncultivated.

Finally, spatial factors, which act at the scale of land plots, contribute to the processes of territorial transformations. Thus, conflicts of neighborhood appear when agricultural lands are enclosed in residential areas. The measures taken to limit the use of pesticides are more and more drastic when residential areas are close to cultivated lands. Farmers prefer to sell their land and reinstall their farm in less urbanised areas, as for example the department of Var bordering the Alpes-Maritimes.

The decrease of agriculture presents spatial dynamics in connection with urbanisation processes. These processes take place gradually from built-up areas, so the farmland which adjoins or is near to them have a large propensity to disappear. Thereby, spatial surroundings of agricultural areas, in terms of land use, act on their sensibility to urbanisation (Liziard S., 2008). Farming areas with a certain unity on wide surfaces have a better resistance to urban sprawl than the isolated or small-sized agricultural areas. As the extension of residential areas is oriented by road networks, the farmland located nearby, with a good accessibility, are therefore subject to a preferential urbanisation. The disappearance of specific agricultural areas between 1975 and 2000 also shows the pursuit of

particular advantages: on the valley beds, flat places are ideal for the installation of large-scale infrastructures; the ridge lines, hills and low hillsides offer a panoramic view and pleasant surroundings. Thus, the agricultural areas urbanisation refers to spatial factors not only corresponding to the search of practicality in the activities localisation, but also to the want to live in rural surroundings and near coastal urban areas.

3 Prospective and discussion

In spite of the slowing down of farmland artificialisation process observed, agricultural areas continue to decrease inexorably. Risks of disappearance are different according to agricultural specialisations. The symbolic floral cultures of the Côte d'Azur are, with vegetable farming, the most threatened. These cultures, generally under greenhouses or under low shelters, are considered as unaesthetic. On the contrary, landscapes of vineyards and olive groves are more valued. Consequently, these latter landscapes are the object of more attention in town planning documents than the first ones. Spaces with stakes are henceforth situated in the valley bed, on hillsides and summits of hills offering a clear view. If the observed tendencies continue, the emerging scenario is the one of a more and more urbanised coastal zone where the remaining agriculture would be residual. Some agricultural spots would be the subjects of protection: vines with a protected designation of origin, olive trees and cultivations recognised as homegrown. The rest of the agricultural areas would be gradually transformed into wasteland. During the renewing of town planning documents, the most suitable uncultivated plots of land for construction and the most accessible would eventually be classified as buildable land. The steeper sloping plots of land, affected by secondary vegetation, would change to the category of natural areas. The photo of the figure 2 illustrates the current process.

Fig. 2. Landscape of the Nice hills, in 2003

Landscape degradation would be irreversible, quite particularly on hills overlooking the coastal plain. The variety of traditional rural landscapes would be first substituted by a disorder resulting from the neglected cultures, then by a stratified landscape characterised by residential buildings on the summit of hills and the highest hillsides and forested areas in the middle-slope, and finally, an urbanisation combining activities and housing in the valley beds.

Is it possible to stop this evolution? Is there any desire to do so?

The laws promulgated in the last few years gave to local authorities some new tools to control this decrease of agricultural areas. Town councils and Prefectures of regions can ask for the classification of farming areas in “Zone Agricole Protégée” (ZAP) because of the quality of their production or their geographical situation (periurban zone, erosion sensitive areas, land with typical agriculture). The

"agricultural vocation" is set up as "easement in the public interest" what allows for it to take from unforeseen fluctuations in the land-law. In 2001, the « Etablissement Public Foncier de Provence-Alpes-Côte d'Azur" was created in order to carry out land transactions and protect agricultural areas. A law passed in 2005 confers to the departmental authorities the right to delineate "perimeters of protection and development of periurban agricultural and natural areas", (PAEN). Thus, legal arsenal more effective than previously given to local authorities, some of them have chosen to use it. The *Alpes-Maritimes* General Council decided to buy land which will be protected by means of PAEN. In the Var plain, an "Opération d'Intérêt National" was enacted in March 2008. The OIN project presents a double objective of protection and development of the Var plain under the label "Eco Vallée".

The realisation of the environmental utility of agricultural areas is still limited. Nevertheless, their functions are essential in Mediterranean zones. They play the role of firewall, slow down landslides, restrains floods. ICZM policies are not very interested in coastal agricultural areas. They focus on polluting farm waste and don't pay enough attention to the protection of Mediterranean agricultural landscapes. The "Conservatoire du Littoral" sometimes purchases agricultural areas which are abandoned because of land pressure or urbanisation threats. Then, an activity of vineyards is reinstalled there because this is a way to keep the balance of nature at the lowest cost. But until now, no purchase of this type has been completed on the Côte d'Azur.

The landscaped patrimonial value of coastal agriculture is still not acknowledged enough on the Côte d'Azur, unlike what we can observe in certain coastal areas of the Var department. The most pleasant coastal landscapes combine a view of the sea, Mediterranean cultivations and wooded areas. On the peninsula of Saint Tropez, the classification of the site and a strict application of the "Loi Littoral" enables the containing of urbanisation and the spread of vineyard areas in combination with self-catering cottages.

However, many people think that the fate of coastal agriculture is sealed. Legal measures have come too late and they are insufficient to confront the intensity of the land pressure exerted on agricultural areas. For the economist Claude Napoléone, an important part of the Mediterranean non-built-up coasts belongs henceforth to banks and pension funds which make long-term investments. According to him, only drastic measures of lands protection coupled with a policy of urban densification and the creation of a "Conservatoire des espaces agricoles" on the same type as the "Conservatoire du Littoral", could overcome the phenomenon.

4 Conclusion

To sum up these complex relationships between coastal landscapes, agriculture and urban areas, two conceptual systemic graphs have been built (Fig. 3). The first one is related to the period 1900-1970. Since the 19th century, agricultural areas have always been major components of the regional attractiveness. These assets have contributed to the development of tourism and of the residential function. Until the seventies, urbanisation extended without encroaching on the agricultural activities because clear space was available on the coast. Afterwards, the links between agricultural and urban areas, as well as those between the coastal zone and the closer hinterland, became more complex. During the period 1970-2008, several laws and local territorial policies have tried to protect the sensitive coastal areas and to slow down the urban sprawl. As the agricultural lands did not get the same protection, the urban pressure has been moving towards them. Agricultural areas located on the coast, are more desired if they are flat, with a good accessibility to the metropolitan area, with a pleasant environment and a view of the sea. Nevertheless, the available space has become scarcer on the coastal territory, so urbanisation has been progressing inland to the detriment of the agricultural

areas. The logic of these littoral spatial dynamics reaches disturbing limits. The desire to take advantage of environmental assets leads to an intense urbanisation of the agricultural areas. The consequence of such an evolution is a degradation of the local landscape which plays a major role in the coastal attractiveness. Henceforth, territorial stakes lie in the recognition of the landscaped patrimony represented by the agricultural areas of the Côte d'Azur and in the protection of the agricultural lands of the coast as those of the closer hinterland.

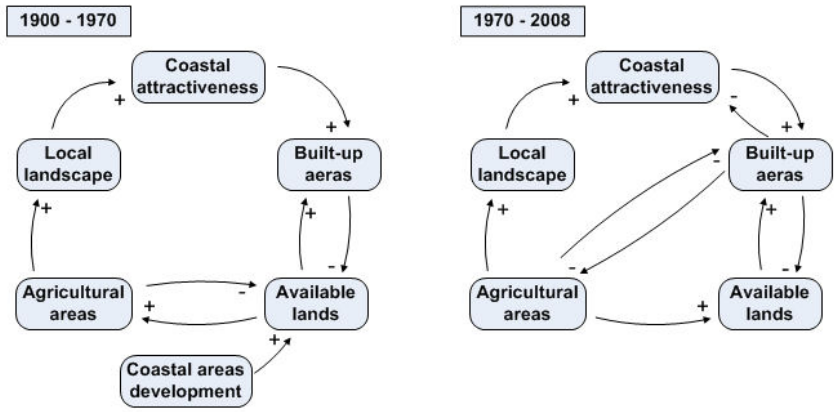


Fig. 3. Causal diagrams of coastal spatial dynamics

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