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THE SPATIAL EFFECT OF INDUSTRIAL ESTATES IN THE INDUSTRIALIZATION PROCESS IN THE COUNTRIES OF THE CARIBBEAN.

As a result of industrialisation measures, various spatial structures have grown up in the developing countries which show remarkable disparities. In order to prevent even more development mistakes, it is usually necessary to undertake extensive structural and spatial planning measures. This is particularly the case in the Caribbean region which will be dealt with here in detail.

When one considers the relatively small size of the majority of the Caribbean territories, then, at first, it is hard to believe that they could have serious spatial problems. In reality, however, sometimes development failures appear more often than in the larger development areas on the mainland. Almost all of the Caribbean islands, as is quite common in developing countries, are confronted with the problem of rapidly growing population along with an increase in the number of unemployed and under-employed.

At the most moment, 26 million people live on the Caribbean islands which results in a population density of 113 inhabitants/km² (including the Bahamas). The Lesser Antilles, which have 10% of the total population are far densely settled. The average population density there is 205 inhabitants/km² and on Barbados it reaches the high value of 558 inhabitants/km².

The urbanisation trend of the last thirty years is an important geographical phenomenon. Particularly in recent times, the urban population has grown rapidly reaching an annual average increase rate of between 3% and 6%. This rate shows that the urban population expands twice as quickly as the total island population.

Wild and uncontrolled settlements have become a significant feature on the peripheries of the Caribbean cities and in their ecological recesses, especially in those areas where there is a high job density. It is thus not difficult to understand why marginal population growth is one of the most urgent problems connected with the urbanisation process.

In the majority of these countries, development plans have been drawn up whose major aim is to create employment opportunities. The creation jobs in the secondary sector is not only an important economic measure but it also influences the spatial organisation. Industrial estates are a widely dispersed form of industrial colonisation in the Caribbean (H.-D. HAAS, 1976, p. 115).

Industrial estates were first laid out at the turn the century in Great Britain and then later in the USA, increasing in number since the 1930's. After the Second World War the concept of industrial estates spread to numerous other industrial

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countries as well as to many developing countries, above all India.¹ Today, the industrial estates in the developing countries must be regarded as an important form of the structural and spatial development of industry.

By use of examples taken from the Caribbean, three theses will be examined below in an attempt to test their validity:

1. Industrial estates are important for the entire economy. Particularly in developing countries is their influence on the speed of the industrialisation process great.
2. The industrial estate which is a special kind of industrial location, where different branches have a common site, is an important determining factor for spatial organisation.
3. The government-organised industrial estate is a spatially effective method of regional planning.

First of all, what is meant by the term industrial estate? Industrial estates are areas which are reserved for industrial purposes and in which sites and/or factories and certain services are offered to the firms which settle there. They are industrial agglomerations which are planned and organised by development companies. The provisions offered by the industrial estates vary from the development of the site and the construction of a basic infrastructure to the erection of factory buildings and the provision of various services, for example, canteens, kindergarten, education centres, etc..

To what extent does one find industrial estates in the Caribbean? The majority and oldest of the industrial estates are on Puerto Rico, where, in connection with the industrialisation programme »Operation Bootstrap« which was begun in the 1940's, so-called industrial subdivisions (with normally less than six factories) were established in all parts of the island. Through the industrialisation programme of the Industrial Development Corporation, a total of over 40 000 industrial jobs have been created, roughly half of which are in industrial estates. Industrial estates have been established recently in the Dominican Republic, on Haiti and, since the 1960's, on Jamaica where the most dominant one is the 120 hectare Kingston Industrial Estate. There are 45 firms which employ just under 3000 people.

There are also industrial estates on many of the islands of the Lesser Antilles, particularly on the Windward Islands which belong to the area influenced by British culture. They are particularly well dispersed on the islands of Trinidad and Barbados, each of which has eight industrial estates (Fig. 1). On Trinidad, 5000 jobs were created in 105 firms and on Barbados 66 of the 160 industrial firms promoted by the Barbados Industrial Development Corporation have been settled in the government-owned industrial estates, 76 % of the firms are housed in factory buildings belonging to the Corporation.

How important is the spatial effect of the industrial estates in the Caribbean? In other words, how valid are the hypotheses 2 and 3? My conclusions are based on research which I undertook during three visits between 1972 and 1976 to the Caribbean and which covered the majority of the known estates. Numerous sta-

¹ (U.P. RITTER, 1961, H. NIESING, 1970, J.R. BALE, 1974, K. HOTTES, 1976, A. HÜTTERMANN, 1978).

Industrial Estates in the Antilles

Fig 1



tements made here are based, above all, on several weeks' work in collaboration with the Industrial Development Corporation in Port of Spain. Important data were collected through employee and employer questionnaires which were carried out in the industrial estates and which took the form of a sample study. On Trinidad, the size of the sample for the employer questionnaire was 30%, whereas on Barbados it was possible to increase this to 85%. On the other islands which were examined the size of the sample was approximately 20%. The analysis showed that one must differentiate between the regional and temporal evaluation of industrial estates in the Caribbean. For a few islands, it is clear that the industrial estate has been a great success but in the case of others, one must criticise the introduction of this type of industrialisation policy.

The industrial estates on Trinidad, Jamaica and Haiti shall act as examples here. On Trinidad, the vast majority of the eight industrial estates created by the state-run Industrial Development Corporation are to be found within the conurbation areas. Their location, therefore, only partially conforms with the concept of spatial organisation. Here, as is also the case in the Kingston conurbation on Jamaica, the industrial estates perform a relief function, i. e. they accommodate the firms which are prepared to move out of the city centre. The businessmen on Trinidad and Jamaica can acquire or rent sites and buildings to very reasonable terms in the peripheral industrial estates but the major industrial settlement takes place in the industrial estates which are close to the centre. From the businessmen questionnaire it was clear that the attraction of firms to the peripheral industrial estates had been unsuccessful because the necessary infrastructure outwith the sites had not been developed by the Development Corporation. The major complaints concerned the lack of a telephone network, a bad electrical service and the bad road conditions. It is thus not enough when the corporation only develops the industrial site. It is far more important that there is a good infrastructure connecting the site with the major transport networks.²

In addition, the contact advantages important in the industrial countries, also play an important role here. The businessmen were hardly prepared to move away from an urban centre or a port, 73% of the people questioned on Trinidad said that they were not prepared to move to a rural district under the conditions which prevail at the moment. The large financial advantages are of secondary importance. The infrastructure in the rural area is decisive.

On the other hand, the planning authority on Trinidad believes that it must, first of all, develop the infrastructure there where the demand is the greatest and that, of course, is naturally in the conurbation area around the capital.

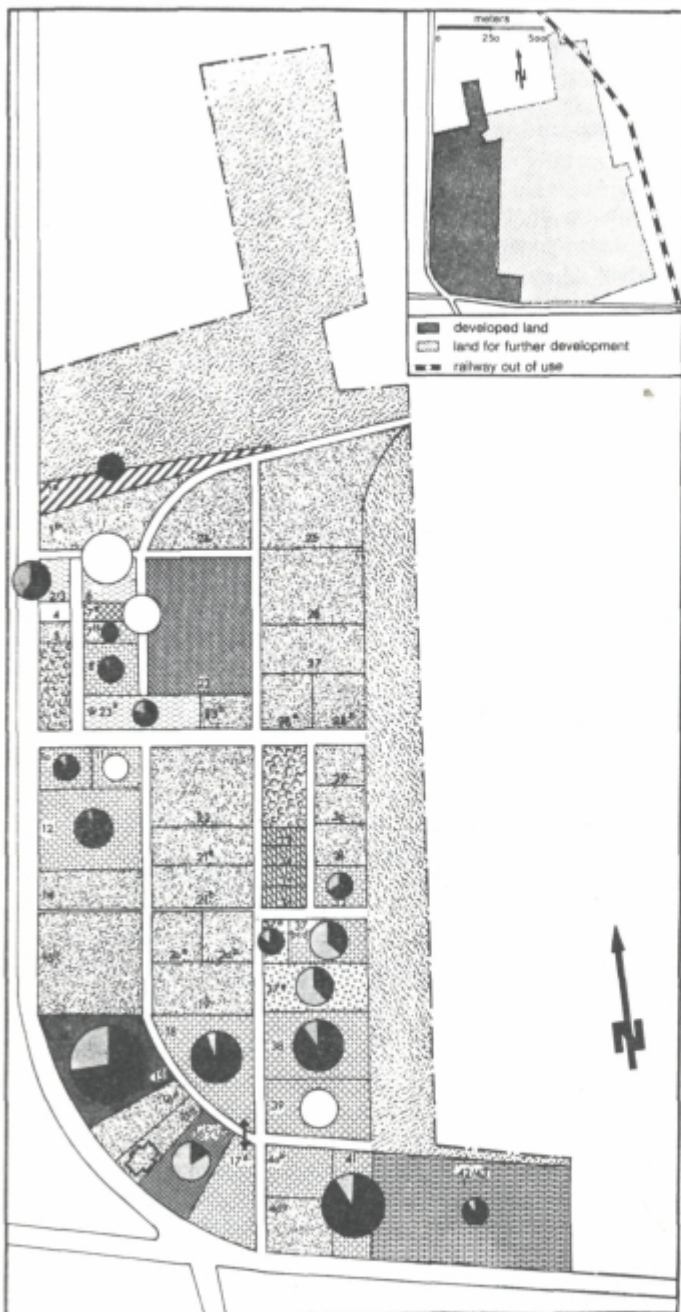
Because of the heavy concentration of industrial estates in the immediate city region, the authorities responsible for their location have themselves encouraged a rural-urban migration of the population.

Almost a third of the population of Port of Spain, which has 160 000 inhabitants live in the slum areas or in barrack settlements. Some of these quarters increased their population by over 100% between 1960 and 1970. This is particularly true in East Port of Spain where 25% of the population are squatters. The job opportunities offered around the industrial estates have not just draw people from the rural areas of Trinidad. Roughly half of the migrants come from neighbouring islands, particularly from Grenada and St. Vincent.

² The O'Meara Industrial Estate, Trinidad, (Fig. 2) is well developed, but it is already too far away from the Capital Region. This is the reason for the large number of vacant lots.

O' Meara Industrial Estate

Fig. 2



Types of Industry

- food beverages, tobacco products
- textiles, garments, leather products
- printing
- chemistry, chemical products
- non mineral products, ceramics, glass
- metal products, electrical appliances
- machinery and transport equipment
- others

Number of Employees

- 251 and more
- 101 - 250
- 51 - 100
- 26 - 50
- 11 - 25
- to 10
- percentage of male employees
- enterprises under construction - projected total number of employees

- recreation areas
- trade
- other services
- 15b plot number
- areas for industrial expansion
- areas for further development
- boundary of buildings
- boundary of plots



When questioned about the motive for the move to such areas, the squatters answered that they wished to be as close as possible to the job opportunities. Further, it is possible to state that family ties are very important. The squatters, once settled, send for ever increasing number of relatives. Thus, there are often very heavy concentrations of people from Grenada and St. Vincent in some of the shanty-towns.

Within the framework of its industrialisation policy, the industrial estate concept has also been put into operation on Haiti.³ The only industrial estate on the island is the Parc Industriel Métropolitain in the north of the capital and it has been in existence since 1974. Up until now, 12 firms have settled here with 1253 employees. 4 factories are under construction and by 1979 20 firms with approximately 2000 employees should be settled in the industrial estate.

From the spatial organisation point of view, the location of this industrial estate was a failure in two respects. On the one hand, by location the industrial estate in the city region, the already heavy concentration of industry in Port-au-Prince was increased and, on the other hand, by not choosing another location, the chance to create jobs near the area of low-income population was lost. The majority of the employees in the Parc Industriel and the bordering industrial zones live in the slum areas of Carrefour which lie about 10 km away from the city. In addition, the industrial estate was built in the industrial zone of Chancelles-Aéroport which was already under the influence of self-growth dynamics and thus did not require a further growth stimulus.

In the future, the industrial estates on Haiti are to be built, above all, in the provinces as a measure against the ever increasing population movement on the island and the related metropolisation; 72% of the industrial workers in Port-au-Prince have migrated to the capital.

It is, therefore, clear that the industrial estates promote the suburbanisation process. The question is then raised: Could the people responsible for the planing of the industrial estates, the Industrial Development Corporations, not possibly influence this trend more strongly? As answer, it has to be stated that the Industrial Development Corporations on Trinidad Jamaica and Haiti are themselves not allowed to acquire land in contrast to Puerto Rico and the PRIDCO. Acquisition is undertaken by the government Real Estates Department or Evaluation Department. Thus the chance that the Industrial Development Corporations can influence the trend is small. The fact that the process of land acquisition lasts roughly five years means that it has an unfavorable effect on spatial organisation. Up until now, all industrial estates on Trinidad, with one exception, have been built on Crown Land. This is, however, not available on all parts of the island. On Puerto Rico, the responsible administrative authority, the PRIDCO mentioned above, has more power. It is able to buy the land for the development of the industrial estates itself and thus has a 3 to 5 year supply of developed industrial sites in different parts of the island. The final choice of land has to be made in agreement with the Puerto Rico Planning Board which is responsible for regional planning. Regional planning on Puerto Rico is well developed in comparison with Trinidad where it is carried out by the Town Planning Departments and is thus still in its early stages.

Up until the beginning of the 1970's, industrial and structural development were the only aims of national economic politics. The spatial organisation problems resulting from this have only just recently been recognised. This example shows that here, as in the majority of other Caribbean countries, regional planning

³ I am grateful to Mr. Rolf Nonnermann for providing data on Haiti.

must concentrate on the creation of decentralisation policies. Particularly important in this context is the preparation of satisfactory sites for the industrial estates which are connected to middle-sized centres with a good infrastructure. Only in this way it is possible to develop growth poles in the areas peripheral to the main city. On Puerto Rico, regional planning policies were, already in the 1960's, directed at taking the burden away from San Juan and the regional centres of Ponce and Mayagüez date from this period. The aim of these regional centres was to economically strengthen the less developed central mountain region. In the first phase of industrial development (1942-1955) on Puerto Rico, it was also true that approximately 60% of all the new jobs were established in industrial estates in the San Juan area where, at that time, less than 20% of the total population lived. Today, the Industrial Decentralisation Programme is the basis of spatial organisation politics on Puerto Rico. With its help it may be possible to reduce the originally heavy migration in the direction of the city and thus lay the ground stone for a balanced relationship between San Juan and the rest of the island.

I hope that this exposition has shown that:

- 1) the industrial estate is an important part of the development strategy on numerous Caribbean islands whose primary aim is to increase rapidly the national supply of non-farming jobs. Because the jobs created in the industrial estate from a large percentage of the total supply, the first hypothesis may be seen as valid if one disregards the small estates in the peripheral regions.
- 2) The industrial estate is, as stated by Isenberg, a determining factor for spatial organisation in two respects. First of all, in a positive respect, — in conurbation areas, the location of industry is controlled in a manner conforming with the ideas of spatial organisation and, secondly, in a more negative respect, — it promotes the unwanted suburbanisation process in the conurbation areas.
- 3) As has been shown here, the government-organised industrial estate is only a partially effective regional planning measure. For the businessman, traditional locational factors are far more important for firm economic than the time-limited grants offered by the government. The businessman is more likely to accept governmental location management if the money for the grants would be used instead to develop the infrastructure in the rural areas. The third hypothesis is valid for the conurbation areas almost without exception. In the case of the rural regions, however, it can only be declared valid if it is an intricate part of a larger growth pole policy.

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PROSTORSKI UČINEK INDUSTRIJSKIH OBMOČIJ V PROCESU INDUSTRIALIZACIJE V KARIBSKIH DEŽELAH

Podobno kot v drugih manj razvitih deželah se tudi Karibsko otočje srečuje s problemom hitre rasti števila prebivalstva in nezaposlenosti. Na otokih, ki so precej gosto naseljeni (povprečna gostota znaša 113 preb./km²), živi 26 milijonov prebivalcev. Stopnja urbanizacije je v zadnjih 30 letih zelo visoka; letno se število mestnega prebivalstva poveča za 3 do 6%. S tem je povezan nastanek divje zgrajenih in nekontroliranih naselij na robovih mest. Visoka stopnja nezaposlenosti želijo vlade odpraviti s hitrim povečanjem števila delovnih mest v industriji, pri čemer igrajo posebno vlogo industrijska območja. To so površine, ki jih državna uprava rezervira za industrijske namene. S posebnim statusom in različno stopnjo infrastrukture opremljenostjo so industrijska območja privlačna za podjetnike, ki na njih gradijo tovarne. Industrijska območja so razširjena po vsem otočju, imajo pa različne učinke na svojo okolico. Na Trinidadu so na primer znotraj konurbacijskega območja, zato njihova lokacija le delno sovпада s konceptom enakomernega regionalnega razvoja. Na Trinidadu in Jamajki podjetniki sicer lahko dobijo pod zelo ugodnimi pogoji v najem industrijska podjetja zunaj mestnega središča a zanje ni pravega zanimanja ker manjka ustrezna infrastruktura (telefon, elektrika, ceste). Zgrajena infrastruktura je pogoj za lokacijo industrije na agrarnih območjih.

Lokacija industrijskih območij se s stališča prostorske organizacije ni obnesla na dveh področjih. Na eni strani se je s postavitvijo industrijskih območij v mestno regijo povečala že do sedaj močna zgostitev industrije, na drugi strani pa se ni izkoristila priložnost odprtja delovnih mest v predelih, kjer žive prebivalstvo z nizkim narodnim dohodkom. Do začetka sedemdesetih let je bil industrijski razvoj edini cilj nacionalne gospodarske politike. Prostorske problematike, ki iz tega izhaja, so se oblasti zavedle šele sedaj. V bodoče bo treba na Haitih graditi industrijo na podeželju, da bi preprečili naraščajoče doseljevanje prebivalstva v mesto: 72% industrijskih delavcev v Port-au-Princeu je doseljenih.