

result of diseases and ill-treatment. In the longer term, commercial agriculture proved unable to compete with that of the better organised farms elsewhere in the colony. As a result, agricultural activity gradually became increasingly limited to some shifting cultivation, mainly for self-sufficiency, and to a rather irregular gathering economy. In the mid-nineteenth century there were only a limited number of plantations of coffee, tobacco and citrus near the mouth of the Amazon, which did not provide great prosperity for their owners. The island of Marajó opposite Belém was used for cattle breeding. The cattle grazed there on the moist savannas and had to survive in the wet season that flooded part of the island. Elsewhere in the Amazon, savannas were also used for livestock farming during the dry season.

After 1875 new attempts at colonisation were made in the area east of Belém to near the border of Maranhão. The main intention was to create a zone of nurturing agriculture and livestock for the city of Belém, which was experiencing a strong population growth thanks to the rise of rubber gathering. In view of this, the construction of a railway to Bragança was started in 1883 and completed in 1908. Most of the state-established colonies did not flourish. Many settlers (partly from abroad) left because the colonies were poorly governed and insufficient guidance was given.

After the severe drought that occurred in Northeastern Brazil in 1915, the area experienced spontaneous colonisation of *nordestinos* who tried to find a more favourable habitat. In the area of Belém–Bragança, they not only found land on which to practice subsistence farming, but also an environment that still showed a certain resemblance to the Northeast (at dry season). The local population growth also stimulated colonisation. As a result, the area between Belém and Bragança became a relatively densely populated zone. In the 1960s, densities of between 15 and 20 per km² were to be found. It was then one of the few regions where activity was not limited to collecting forest products, but where arable colonisation had taken place on a relatively large scale in the past. The area had benefited greatly from its proximity to Belém, which had been a collection point for all kinds of Amazon products from its foundation and also functioned as a distribution centre, from where the settlements upstream were supplied. Particularly after 1870, the city saw a sudden growth in its function as a collection and distribution centre as a result of the rubber boom. This created an urban market for the sale of agricultural surpluses.

The rubber period

In the second half of the nineteenth century it seemed as if Northern Brazil would play an important role in the world economy. After the invention of vulcanisation, rubber got more and more applications and the Amazon region turned out to be the only area where the *Hevea brasiliensis* (rubber tree) occurred. Rich extraction areas were mainly located south of the main river and to the west. A monopoly position seemed assured. This was all the more true since Brazil had the advantage that the Amazon was navigable all year round for seagoing vessels as far as Peru and that many tributaries could also be used by shipping.

The growing demand for rubber awakened the entrepreneurial spirit present in many Brazilians. Speculators, in possession of capital, managed to purchase large areas of forest in the Amazon region or acquired the right to exploit the existing rubber trees. Gradually they organised the tapping of rubber trees on an increasingly large scale.

A North American colony

Shortly after the end of the North American Civil War a group of people from the Southern States of the United States, desiring to continue under a regime of slavery, established a settlement not far from Santarém, bringing their slaves and tools with them. In the 1870s this group was visited by a North American traveller who found it filled with pioneer zeal, enthusiastically engaged in clearing the forest and planting cotton and sugar cane. But the place selected for the colony was too remote. Although steamboats sailed the Amazon after 1866, making Santarém a regular port of call, the cost of transporting the small volume of cotton or sugar to distant markets and of importing essential articles, was so great that the North American colony near Santarém was almost entirely cut off from the outside world. No occidental pioneer colony which remains in isolation has been successful in the modern period, whether in the Amazon or elsewhere. Today, only a few impoverished families remain, and these have lost the optimism which is the chief strength of the successful pioneer (James 1969, 840–841).

Labour power was initially a problem. The Indigenous people were few and unwilling or unfit to serve as rubber tappers, and slaves of African descent were difficult to employ in self-employed work in the jungle. Moreover, the import of slaves was already forbidden. That is why the operators mainly tried to recruit their workers from the (*mestizo*) population of the nearby Northeast. When catastrophic droughts occurred there at the end of the 1870s, this recruitment was no longer a difficult matter. Tens of thousands of *nordestinos* moved to the Amazon region to find a new living as rubber tappers. After that, the gradually emerging migration tradition and some new droughts ensured that new workers regularly became available. It is estimated that, in total, about 300 000 *nordestinos* came to the Amazon region in the period 1870–1910. Among them were many residents of Ceará.

The workers did not gain much from collecting. The entire rubber extraction activity was soon completely controlled by landowners, concessionaires and merchants, who made good profits.

The workers led a hard and poor life. After being recruited in one of the towns and committing themselves to rubber tapping for a period of time, they were dropped off along one of the rivers with some food and the necessary equipment. Since the rubber trees in general were widely spread, the extraction became a labour-intensive affair. The collected latex had to be evaporated over wood fires, after which it was collected at regular intervals by the traders. On those occasions the tappers were provided with fresh food and other necessities. They were almost never paid in money; the rubber was taken in exchange for goods. Many *seringueiros* began with debt because they could not pay for the necessities for their initial stay themselves. Most traders abused their position and supplied relatively few items in exchange for significant quantities of latex. Many tappers only got deeper into debt. The copious consumption of liquor caused a lot of financial problems. The tappers had little or no additional resources; most lacked the time and energy to practise some subsistence farming. On balance, the earnings were small, the tappers were deprived of all comfort, and had to contend with diseases

and the dangers of the tropical jungle. Many perished; their places were taken by other *nordestinos*.

In the period 1820–1830 Brazil exported less than 50 tons of rubber. In the years 1860–1870 the amount had increased to 4 000 tons and in the years 1908–1910 an average of 38 600 tons per year was exported. Rubber supplied more than a third of the total value in exports at the time, making it an important source of foreign exchange.

After 1910, the golden age quickly came to an end. As early as 1876, Wickham had smuggled rubber seed from Brazil so that rubber plantations could be established in Southeast Asia. These started to produce rubber at a much more favourable price and were much better able to meet the growing demand. While the wild rubber trees yielded on average no more than 1.5–2 kg of rubber per year, the Southeast Asian plantations achieved yields of 5 kg or more, thanks to better tapping methods and better care. The more favourable cost price also arose because the vegetation in the tropical rainforest is heterogeneous in composition. Rubber trees stand among many other trees, leaving one worker in the Amazon region unable to tap more than about 200 trees. On the plantations, on the other hand, only one worker was needed for 500 trees. In densely populated monsoon Asia, a large number of suitable workers was fairly easy to find, while recruitment for the Amazon region was much more difficult. It soon became clear that Brazil's initially strong market position could not be permanent.

In 1910 the plantations of Malacca and Sumatra still produced only 10 % of the rubber, in 1922 it was already 93 %. The Amazon region was eliminated as a significant producer in a short time. The Brazilians had failed to establish plantations. The desire to get rich quickly and easily was paramount and many thought that the Amazon basin was only suitable for a gathering economy. The money earned was mainly spent on consumption (such as for the construction of an opera house) and not for investment in improving the rubber sector and certainly not in diversifying the economy. Even the expansion of agriculture remained very modest. Brazil lost unique development opportunities.

The direct result of the boom was a significant increase in population. In addition to hundreds of thousands of *nordestinos*, Brazilians from other regions moved to the North, and foreigners also settled there. In 1872 the North had 333 000 inhabitants, in 1900 that had increased to about 695 000 and in 1920 to 1.439 million.

Of the towns, Belém and Manaus grew in particular. For the first time, these cities took on real significance and even a cosmopolitan character, becoming abodes of Brazilian and foreign rubber entrepreneurs. The extracted rubber was brought mainly to these two cities and they also became the main distributors of foodstuffs and other necessities. Manaus would exercise this trade function for only part of the North, but Belém for the entire Amazon basin. In 1872 only 62 000 people lived in the entire municipal area of Belém, in 1920 there were already 236 400. The municipality of Manaus saw the population more than triple from 29 300 to 75 700 during the same period. The growth was accompanied by a remarkable modernisation and embellishment. Both cities were among the first to be provided with electricity and early on with public transport. Many public facilities were realised by British companies. Manaus still has a large opera house from that time. The port then had the largest floating quay in the world, at which ocean-going vessels could load and unload all year round.

Rubber extraction did not create an extensive network of roads and railways. The dense vegetation and periodic flooding were a hindrance and the rivers were good

communication routes. There were only simple country roads where land transport was necessary to avoid the falls and rapids. Furthermore, small roads led upstream from the points where the tributaries became navigable. The location of the newly emerged settlements was mainly determined by the waterways. They arose, *inter alia*, at the confluence of the rivers and at those points where the rivers became navigable.

Brazil's rubber economy collapsed after World War I. The strong population growth came to an end: large numbers of *nordestinos* no longer came to Amazônia and part of the economically stronger population moved away. In the period 1920–1940, the population of the North increased only from 1.439 million to 1.462 million. Many capable people left for the Southeast. In Acre, which had been heavily dependent on the rubber economy, the population fell from 92 379 in 1920 to 79 768 in 1940.

Those former rubber tappers who did not leave the region were forced to switch to subsistence farming or to collect other products. A number of them moved to the small towns, where employment was limited, so that open and hidden unemployment increased, (larger) slums were created, and the public service apparatus was overloaded because it could not be expanded and modernised sufficiently through a lack of capital. Many small settlements saw their population decline, even entire villages and workers' encampments disappeared.

In the 1920s and 1930s, the Ford car company tried to set up several large rubber plantations to supply its own company. However, the plantations faced several difficulties. The whole experiment was ultimately unsuccessful.

Such rubber as was produced on a few plantations in the 1960s was entirely for the domestic market. In 1970 Brazil produced no more than 35 000 tons of natural rubber, only a few percent of the world total. Pará, Amazonas and Acre supplied about 90 % of Brazil's natural rubber. The country was unable to meet domestic needs in the early 1960s, which is why the Brazilian government decided to plant two million rubber trees in 1973, but we shall enlarge on this elsewhere.

Developments in the agricultural sector in the early twentieth century

During and after the Second World War, the agricultural sector underwent a modest but certainly not insignificant development, thanks to Japanese immigrants. They had settled in the Amazon after 1920 and, in the 1930s, focused on jute and pepper cultivation. After some experimentation, they were so successful with this that cultivation expanded quite quickly. Non-Japanese people also started to focus on production. In the 1960s, jute and pepper were among the most important commercial crops. The value of each of those products exceeded that of the collected rubber.

The pepper culture was concentrated entirely on *terra firme* (non-floodable soils) in the vicinity of Belém and Manaus. However, the area near Belém was by far the most important. About 90 % of the pepper production took place in the state of Pará, where pepper was the main agricultural crop. The Japanese colony of Tomé Açu, which had been founded in the 1920s about 200 km south of Belém and which had become heavily involved in pepper production, especially after the Second World War, supplied no less than two thirds of the Brazilian harvest in the 1960s. Total Brazilian production had increased to 14 522 tons in 1970, while in 1952 it had been only 350 tons. The production not only covered the national need; most of it could even be exported. The success