The Making of Sino-Dutch Sugar Frontiers in Early Modern Asia: Connections and Comparisons, 1630s-1730s

Universiteit Leiden

XU Guanmian (Victor)

13 July, 2017

s1721844

M.A. in Colonial and Global History

Leiden University

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Note on Weights, Currencies, and Measurements

One Rijnland morgen is about 600 square Rijnland Roeden, and about 0.85 hectare.

One morgen=6 hont; one hont=100 roeden; one roede=144 voeten.

One Rijnland roede is 3.767m.

In Batavia, one picul of sugar was 125 pounds.

One tael Japanese *schuitsilver* (boat silver) was a measurement of weight equivalent of 37.565 grams and equivalent.

In Asia, one rijksdaalder was worth one rial or1.25 bad rials (*slecht real*) of 48 stuivers; it was roughly 48 stuivers or 2.5 gilders before the 1650s; thereafter, it was worth 60 heavy stuivers or 75 light stuivers, and it was then also worth 3 gilders, since a gilder was an accounting unit of 20 heavy stuivers. The light stuivers were further abolished in the second half of the eighteenth century.[1]

[1] Willem G. Wolters, "Heavy and light money in the Netherlands Indies and the Dutch Republic: dilemmas of monetary management with unit of account systems," *Financial History Review* 15:1 (2008): 37-53.

"At that time, the whole territory from the head stream of the Angke River all the way to the garden of the king consisted of jungle and grassland, bare and swampy, but from then on people began to cultivate sugar cane and vegetable gardens. They cleared off the wild grasses and the trees. The Hollanders then built garden houses and water pavilions—a beautiful spectacle to behold!—in order to enjoy themselves at leisure … The men of the sugar mills cut the forest day and night until the firewood ran out. The sugar mills moved further inland, closer to the forests. Starting out from near the city, the millers expanded [their plots] farther and farther away."[1]

Introduction

In the Chinese Chronicle of Batavia, the above brief description tells a story which is unfamiliar to many colonial and global historians. That story is about how the land outside the city-wall of Batavia, that is, the Ommelanden, was reclaimed by Chinese sugar planters from the mid-seventeenth century onwards. The puzzling point of this story is that it was referring to a history of Chinese sugar plantations in the Dutch East Indies. That history could neither fit the mainstream plantation history in European colonial expansion, nor the agricultural history of early modern China.

Since the end of the 1990s, historians on the world economy have paid tremendous attention on the questions of whether, how, and why the economies on the two ends of Eurasia, that is, West Europe and East Asia, had diverged since the early modern period. A major point arising from their discussions is that the countries of West Europe were able to support their entrepreneurs to build plantation economy in the New World, which helped European society successfully pass the ecological constraint; in comparison, the Chinese rural society was characteristic of small householder economy, which could not be mobilized into a plantation economy for large-scale capitalist agriculture.[2]

That "great divergence" discourse could not work with these Chinese plantations in the Ommelanden, which were rather developing along a path of convergence. By the time the above-mentioned description was written down in the end of the eighteenth century, the sugar plantations organized by Chinese agriculturalists had developed into its maturity, which often

[1] Leonard Blussé trans., "*Kai Ba Lidai Shiji*" 开吧历代史记[A Chinese chronicle of the historical events at Yaolaoba (Kelapa)] (unpublished).
[2] Kenneth Pomeranz, *The Great Divergence: China, Europe and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000), 264-269; Sucheta Mazumdar, *Sugar and Society in China: Peasants, Technology, and the World Market* (Cambridge: Harvard UniversityAsia Center, 1998).

employed around 100 labourers and kept more than 100 buffalos. By then, those large scale plantations had moved far away from the Batavia city.[1] Left behind by them, the landscape of the Ommelanden was deprived of its luxuriant jungles and become a place dotted with villages, farmland, markets and the *buitenplaatsen* (outside places) of the ruling class of the Dutch East India Company(the VOC). In other words, Chinese agriculturalists had developed a sugar plantation economy under a European company and that plantation economy had transformed the landscape and rural society of the Ommelanden.

In the process, there are two issues worth highlighting: 1) How people from divergent agricultural traditions of the China coast and the Netherlands converged and created such an unusual Sino-Dutch sugar frontier in early modern Asia; 2) What kind of local society had formed in that sugar frontier as a result of such a convergence. The implications of these questions will be elaborated in the rest of this introduction. It will first(re-)emphasize the often ignored importance of agricultural frontiers in present-day ocean-centric global history. Then discussions will be made on a critical transition in early modern Southeast Asian history. That discussion will lead us to the strange absence of early modern Asia in plantation history. Thereafter, I will bring forward the central topics concerning the overseas agriculture of Chinese entrepreneurs, the rural institutions of the Dutch Company, and the human agents between them.

From oceans to frontiers

To begin with, doing a study of plantation society in the rural area of early modern Asia has yet to be a fashionable research. It is perhaps not too far-stretched to state that there exists a deep-seated bias in the studies of early modern globalization which prefers oceans to lands, urbanity to rural society, and circulation and consumption to production. It has almost become a cliché among students of global history that oceans are the locus of trade, communication and cosmopolitanism, whereas lands are the stages of territorial expansion and nation building. By focusing on the exchange of ideas, people and commodities across oceans, historians have been expecting to break the boundaries set up by national history and to reconstruct the progress of globalization as a diverse process instead of European colonial expansion. For that purpose, networks and transactions across oceans as well as their portals along the coast of

[1] Jan Hooyman, "Verhandeling, over den tegenwoordigen staat van den landbouw, in de Ommelanden van Batavia," *Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen*3 (1779): 173-262; Andries Teisseire, "Verhandeling over den tegenwoordigenstaat der suikermolens omstreeks de stadt Batavia, benevens de middelen tot derzelver herstel, en eenige verdere daar toe betrekkelijke aanmerkingen," *Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen*5 (1790): 1-215.

oceans have occupied the central stage of global history, while the rural and agricultural frontiers in the hinterland of these portals have being marginalized. However, an unbalance of attention like that has failed its purpose, since it disabled the studies of early modern globalization to incorporate the rural areas beyond the walls of the port-cities of European overseas empires and to understand the people who strived and flourished there.

In the region which was historically called by the Europeans the East Indies, that bias is particularly entrenched. Opposite to the early focus of plantation complex in the West Indies, European colonial historians in the East have never given priority to the rural areas of European settlements along the Indian Ocean and the China Seas. Based on their knowledge of the urban life of European trading posts, historians of European expansion preferably depicted the early modern East Indies as a world of trade, where some mighty European overseas companies, such as the Dutch East India Company (the VOC) and the English East India Company(the EIC), knitted heir seaborne empires, but these empires lacked serious motivation to promote territorial expansion before the Battle of Plassey (1757), and to undertake cash-crop cultivation before the cultivation system (*cultuurstelsel*) in mid-nineteenth century Java.[1]

Such a dichotomy between the West and East Indies is yet to be challenged in the recent wave of studies on the worlds of Atlantic Ocean and Indian Ocean. In both fields, new works attempt to redress the Europe-centric versions of early modern globalization by discarding the concept of these oceans as the frontiers of European expansion, and to place them as the centre of cross-cultural interactions. In the studies of the Atlantic Ocean, plantations remain as a central theme, but that theme is considered as a typical Atlantic phenomenon which only started to proliferate into the rest of the world after it had developed into its mature stage in the early nineteenth century.[2] In connection with that, the scholars in the studies on Indian Ocean are also willing to accept or to be silent towards that argument. Many of them are in fact unaware of the existence of plantations in the early modern tropical islands around the Indian Ocean and the South China Sea, and are instead eager to ascertain that, with or without

[1] K. N. Chaudhuri, *The Trading World of Asia and the English East India Company, 1660-1760* (Cambridge: Cambridge University Press, 1978); Kristof Glamann, *Dutch-Asiatic Trade, 1620-1740* (’s-Gravenhage: Martinus Nijhoff, 1981); Holden Furber, *Rival Empires of Trade in the Orient, 1600-1800* (Minneapolis: University of Minnesota Press, 1976); Els M. Jacobs, *Merchant in Asia: The Trade of the Dutch East India Company during the Eighteenth Century* (Leiden: CNWS Publications, 2006); Ulbe Bosma, *The Sugar Plantation in India and Indonesia: Industrial Production 1770-2010* (New York: Cambridge University Press, 2013).

[2]Philip D. Curtin, *The Rise and Fall of the Plantation Complex* (Cambridge: Cambridge University Press, 1990); Stuart B. Schwartz, ed., *Tropical Babylons: Sugar and the Making of the Atlantic World, 1450-1680* (Chapel Hill: The University of North Carolina Press, 2004).

European colonial powers, the early modern Indian Ocean was always a trading world.[1] In that way, a false concept was firstly created by European expansionists, and then re-enforced by their challengers.

Not only ignored by global historians, the commodity frontiers in the rural society of the early modern European empires in the East Indies are also largely overlooked by the recent wave of the global environmental history. Scholars like John F. Richard and Jason W. Moore have articulated that the expansion of world economy had its profound ecological consequence on the frontier areas as early as the early modern period. [2] Yet the alleged global scope of their studies is still largely confined to the frontiers of the European empire in the Atlantic world and of the Asian empires in their own territories. The rural areas of the European empires in early modern Asia have yet to be examined.

In fact, the European colonial expansion in early modern Asia had created its own unending frontiers in the East Indies and had caused profound and diverse environmental changes. For instance, sugar, as environmentally-unfriendly cash crop, had devoured dense jungles for firewood and exhausted the fertility of vast virgin land in the early modern period. That crop was introduced into the Dutch East Indies in the 1630s by Chinese immigrants and had since begun to change the landscape of Dutch Formosa and Dutch Java. Yet the ecological influence of the sugar cultivation in the Dutch East Indies diverged tremendously across those two islands. It ranges in a spectrum from the sustainable and high-productive frontier in Formosa (Taiwan) to the exploitative and crisis-ridden frontier in the Ommelanden.

A rural perspective, with focus on the frontier societies in the hinterlands of these trading worlds, in my opinion, has potential to refresh present-day's ocean and port-city centric historiography in approaching the European expansion in early modern Asia.[3] Through that perspective, we will be able to discuss the significance and uniqueness of the Sino-Dutch sugar frontiers in early modern Southeast Asia and to explore how early modern globalization manifested itself in Asian plantation society.

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[1] Michael Pearson, *The Indian Ocean* (London: Routledge, 2003); Edward Alpers, *The Indian Ocean in World History* (Oxford: Oxford University Press, 2014).

[2]John F. Richards, *The Unending Frontier: An Environmental History of the Early Modern World* (Berkeley: University of California Press, 2003); Jason W. Moore, "The Modern World-System" as Environmental History," *Theory and Society* 32 (2003): 307-377.

[3]Most recently, there has been a volume on the comparative studies on the hinterlands of the early modern East Indies, but at this stage, this kind of research is still based on case studies on a particular region, and no systemic investigation has been made yet. Tsukasa Mizushima, George Bryan Souza, and Dennis O. Flynn, *Hinterlands and Commodities:Place, Space, Time and the Political Economic Development of Asia Over the Long Eighteenth Century* (Leiden: Brill, 2015).

A transition in early modern Southeast Asia

The economy and society of Southeast Asia experienced a sea change in the eighteenth century. Before that century, the so-called Age of Commerce (1450-1680) was characteristic of maritime and urban expansion but without significant agricultural development.[1] One century later, from 1780-1900, what fascinated historians is a new era that can be referred to as the age of plantations, when jungles were outrooted by the expanding cultivation of cash crops, commercial capital was channelled into agricultural frontiers, merchants and mariners were outnumbered by planters and coolies, and their produce, all kinds of tropical commodities, served the world markets.[2]

Evidently, determining these changes was the rise of plantation society under territorial colonial states which facilitated the penetration of capital, labourers and cash crops into the hinterland of Southeast Asia, but the problem is that little is known by scholars about the origin of plantation society in Southeast Asia. Ann Stoler, in her celebrated book on the plantation belt of Sumatra, pointed out that the emergence of plantation economy on the northeastern coast of Sumatra in the 1870s was a new development in the Dutch East Indies, because its production was organized in a plantation fashion which differed remarkably from that of Java.[3] In supporting that argument, Stoler illustrated that the labourers of these plantations were mainly Chinese and Javanese coolies who were imported from outside and were hence culturally and socially malleable; in comparison, in the sugar cultivation system of Java, peasants from local villages were mobilized for sugarcane cultivation and their production was embedded in their small-household economy.[4] However, what was perhaps unnoticed by Stoler is that the sugar cultivation system of Java, that is, the famous *cultuurstelsel*, is by itself not traditional. In the case of sugar, the cultivation system was actually a mid-nineteenth-century invention with a specific purpose to replace the preceding system, which, ironically, was organized in a plantation way by overseas Chinese entrepreneurs.[5] These Chinese sugar plantations had been established in the Dutch East Indies

[1] Anthony Reid, *Southeast Asia in the Age of Commerce 1450-1680, Volume Two: Expansion and Crisis* (New Have and London: Yale University Press, 1993).
[2] Anthony Reid, *A History of Southeast Asia: Critical Crossroads* (Chichester, West Sussex: Wiley Blackwell, 2015), 196-212.
[3] Ann Laura Stoler, *Capitalism and Confrontation in Sumatra's Plantation Belt, 1870-1979,* 2nd ed. (Ann Arbor: The University of Michigan Press, 1995), 2.
[4] Ibid.
[5] G. Roger Knight, "From Plantation to Padi-Field: The Origins of the Nineteenth Century Transformation of Java's Sugar Industry," *Modern Asian Studies* 14:2 (1980): 177-204.

as early as the mid-seventeenth century, that is, almost contemporary to the rise of sugar cultivation in the Caribbean region.[1]

The rise of Chinese sugar cultivation under the Dutch East India Company (the VOC) marked the emergence of a new kind of agricultural expansion in early modern Southeast Asia which was associated with the reclamation of unending tropical commodity frontiers under a territorial company-state for a world market.[2] It first appeared circa the 1630s in Dutch Formosa and, to a less extent, in the area surrounding Batavia, that is, the Ommelanden. After Dutch Formosa was lost to the Chinese in the 1660s, the Ommelanden remained as the only place under the VOC's control to produce sugar for its intra-Asian trading network as well as for its metropolis. Its potential to supply these markets was finally achieved in the 1680s and 1690s, when the conclusion of peace agreements with neighbouring indigenous powers and the influx of Javanese labourers and Chinese immigrants jointly contributed to a surging wave of land reclamation in the Ommelanden. In that process, a burgeoning sugar frontier was carved out from the luxuriant jungles which had been previously largely unpopulated in the incessant wars after the Dutch conquest in the 1620s. In the course of the early eighteenth century, this frontier however led to rapid deforestation, soil-degeneration, social turmoil, and, eventually, a devastating Chinese massacre and ongoing wars in Central Java during the 1740s. Thereafter, new order was instituted in the Ommelanden and new sugar frontiers also emerged in the newly-acquired land of the VOC, which as a company-state had extended its territory far beyond the Ommelanden.

The absence of the early modern East Indies in plantation history

The history of these unending sugar frontiers in early modern Southeast Asia points to a critical gap in the studies of the early modern and modern world economy, that is, the absence

[1] Sugar plantations of the New World first took shape in Brazil in the late sixteenth century, and then the centre was shifted to Caribbean region in the second half of the seventeenth century largely due to the intermittent conflicts between the Portuguese and Dutch West Indies Company. Stuart B. Schwartz, *Sugar Plantations in the Formation of Brazilian Society: Bahia, 1550-1835* (Cambridge: Cambridge University Press, 1985), 3-27; Stuart B. Schwartz, "Looking for a New Brazil: Crisis and Rebirth in the Atlantic World after the Fall of Pernambuco," in *The Legacy of Dutch*, ed. Michiel van Groesen (Cambridge: Cambridge University Press, 2014), 41-58; David Watts, *The West Indies: Patterns of Development, Culture and Environmental Change since 1492* (Cambridge: Cambridge University Press), 176-231.

[2] The Dutch *perkenier* system in the Banda Islands might stand as a singular exemption, but that system, in its beginning, was based on the preceding nutmeg plantations of the Bandanese, and its geographical range was also strictly delimited by the VOC throughout the early modern period. Vincent C. Loth, "Pioneers and Perkeniers: The Banda Islands in the 17th Century," *Cakalele* 6 (1995): 13-35. Philip Winn, "Slavery and Cultural Creativity in the Banda Islands," *Journal of Southeast Asian Studies* 43:3 (2010): 365-389.

of the early modern Asia in plantation history. The studies of plantation complex since its very beginning are centred on the Caribbean region, and have recently become increasingly embedded in the concept of the Atlantic Ocean history.[1] Generally, a big picture has been depicted that, in the early modern period, sugar plantations were a trans-Atlantic social and economic phenomenon, which, following the steps of European expansion, firstly extended from its cradle in the Mediterranean to the Atlantic Islands, then to the Brazil and eventually flourished in the Caribbean region.

Such a concept has made global influence and has been accepted not only by historians of the Atlantic world but also by those in the studies of the Indian Ocean and Southeast Asia. Till most recently, in a volume on global and comparative studies of plantation history, the editors hold that "[t]he New World – especially several Caribbean Islands – is generally viewed as a paradigm of the first era [pre-1800] of Western colonialism and sugar power, while the Old World of Asia - and Java in particular – is associated with the later era [post-1800]."[2]

To a certain extent, that dichotomy can be further linked up with a well-known assumption in the world system theory. It claims that the history of sugar plantations is part of the expansion of the European world economy, which first incorporated the West Indies in the early modern period and would only begin to peripheralise the East Indies from the later eighteenth century onwards.[3] Under that framework, the sugar plantations in the early modern Dutch East Indies are not only marginal but even to certain extent "anachronistic".

Admittedly, in the course of the seventeenth and eighteenth centuries, the sugar plantations in the West Indies were incorporated into the European world economy and had also firstly experienced several crucial technological breakthroughs, which would be transferred by the Europeans in the nineteenth century into the East Indies. Different from the sugar plantations in the Dutch East Indies, the plantation complex in the Atlantic Islands, Brazil and the Caribbean was unexceptionally organized by European capital and served the European market.[4] The expanding sugar frontiers of the Atlantic were also the loci where the

[1]Sydney Mintz and Eric Wolf, "Haciendas and plantations in Middle America and the Caribbean," *Social and Economic Studies* 6:3 (1957): 380-412; Sydney Mintz, *Sweetness and Power: The Place of Sugar in Modern History* (New York: Viking-Penguin, 1985); Curtin, *The Rise and Fall of the Plantation Complex*; Schwartz, *Tropical Babylons: Sugar and the Making of the Atlantic World, 1450-1680*.

[2] Ulbe Bosma, Juan Giusti-Cordero & G. Roger Knight ed., *Sugarlandia Revisited: Sugar and Colonialism in Asia and the Americas, 1800 to 1940* (New York & Oxford: Berghahn books, 2010), 6.

[3] Immanuel Wallerstein, *The Modern World-System III: The Second Era of Great Expansion of the Capitalist World-Economy, 1730-1840s* (San Diego: Academic Press, 1989), 129-189.

[4]Curtin, *The Rise and Fall of the Plantation Complex.*

new technologies such as vertical three-roller mill, the water-wheel, and the Jamaica train were invented in order to more efficiently mill cane and boil juice.[1] The introduction of these technologies had been promoted by the European community in Batavia by the late eighteenth century but to no avail. Not until the mid-nineteenth century, the more advanced industrialized sugar manufacture technologies would be successfully transplanted into Java. The works by G. Roger Knight and Margaret Leidelmeijer have elaborated that process.[2] Knight even likened this process as that Prometheus came to Java but took on a distinctively creole character.[3] The metropolis interests introduced important technological innovation such as steam-driven mills, vacuum pans, and multiple effect apparatus into Java. Once they were adapted locally, the reformed Java sugar overshadowed its early modern precursor, that is, the Chinese sugar plantations, in terms of efficiency and productivity.[4]

However, this process does not imply the early modern plantation society of the East Indies had become irrelevant to the modern plantation economy of Southeast Asia in the nineteenth century. In the case of Dutch Java, Chinese-Javanese personnel and capital continuously played significant roles in the reformed sugar plantations.[5] In British Malay, Chinese entrepreneurs opened new commodity frontiers in the nineteenth century by setting up pepper and gambier plantations in the jungles of Riau, Singapore and Johor.[6] Moreover, the unique societal organizations in the modern plantations of Southeast Asia, such as the coolie recruitment and opium farming, actually had their origins in the early modern period.

The plantation society of the East Indies, in my opinion, has its own tradition and deserves its own history, which can be traced back to the early modern period, and which should not be merely presented as an extension or another example of that in the West Indies. A critical element that made it unique is its intriguing origins. Unlike the case of the West Indies, the plantations in Southeast Asia are not only a product of European colonial expansion, but also a result of Chinese commercial and agricultural expansion since the end of the age of commerce in Southeast Asia. In its initial stage, that is, the mid-seventeenth century,

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[1]Christian Daniels, *Science and Civilisation in China, Volume 6 Part III Agro-Industries: Sugarcane Technology* (Cambridge: Cambridge University Press, 1996).
[2] Margaret Leidelmeijer, *Van suikermolen tot grootbedrijf: Technische vernieuwing in de Java-suikerindustri in de negentiende eeuw* (Eindhoven: Technische Universiteit Eindhoven, 1997); G. Roger Knight, *Sugar, Steam and Steel: The Industrial Project in Colonial Java, 1830-1885* (Alelaide: University of Adelaide Press, 2014).
[3] Knight, *Sugar, Steam and Steal*, 33.
[4]Knight, *Sugar, Steam and Steal*.
[5] Idem, 33-62.
[6] Carl A. Trocki, *Prince of Pirates: The Temenggongs and the Development of Johor and Singapore 1784-1885* (Singapore: Singapore University Press, 1979).

the sugar agro-industry on Dutch Formosa and Java was wholesale transferred from the southeast China coast by Chinese immigrants, both entrepreneurs and labourers. It had since been subject to mutations and hybrids. In the course of the eighteenth and nineteenth centuries, it developed into a number of variants which were adapted to and embedded in distinct colonial and indigenous societies of Southeast Asia.

The Chinese century at agricultural frontiers

Whereas the success of Chinese commerce in early modern Southeast Asia has become a major theme in last decades, the significance of Chinese agricultural expansion on these lands is still largely overlooked. That ignorance has led to little scholarly attention to an important aspect of the Chinese century, that is, the Chinese plantation society in agricultural frontiers. In that field, Léonard Blussé and Carl A. Trocki have made some pioneering research. Blussé's early exploration of Chinese sugar agro-industry in the Ommelanden has synoptically introduced how a Chinese sugar frontier emerged there since the mid-seventeenth century and he has also firstly introduced the importance of Chinese agriculture in his renowned framework of the Chinese Century in maritime East and Southeast Asia.[1] Trocki's research period is about one century later and his interests are on the *Kang-chu* system in nineteenth century British Malay, in which Chinese capitalists and Malay rulers collaboratively exploited the jungle of Johor and the labourers from China to produce peppers and gambia for world market.[2]

Unfortunately, the research by Blussé and Trocki around the 1980s has yet to be followed up by new empirical studies and leaves us a number of puzzling questions. To begin with, the connections between the Chinese plantations in the Ommelanden and the *Kang-chu* system in Johor have never been seriously examined. In his review article on the emergence of Chinese labourers' settlement in Southeast Asia, Trocki has attempted to suggest there was a transition of overseas Chinese from urban merchant settlement to labourers' settlement around the mid-eighteenth century and that change had its roots in the Chinese sugar plantations in the VOC's colonies during the earlier century.[3] Yet that heuristic assumption is so far at best a

[1] Léonard Blussé, *Strange Company: Chinese Settlers, Mestizo Women and the Dutch in VOC Batavia* (Dordrecht-Holland/Providence-U.S.A.: Foris Publications, 1988); Léonard Blussé, "Chinese Century: The Eighteenth Century in the China Sea Region," *Archipel* 58 (1999):107-129; Carl A. Trocki, *Prince of Pirates*.

[2] Ibid.

[3] Carl A. Trocki, "Chinese Pioneering in Eighteenth-Century Southeast Asia," in Anthony Reid ed., *The Last Stand of Asian Autonomies: Responses to Modernity in the Diverse States of Southeast Asia and Korea, 1750-1900* (London: Macmillan Press, 1997), 83-101.

speculation, which has neither been tested by Trocki himself nor by other researchers. To make that transition even more elusive is that we actually have no clear picture of how Chinese sugar plantations were organized in the late seventeenth and early eighteenth Ommelanden of Batavia, let alone how the more precocious development firstly emerged in mid-seventeenth century Saccam, Formosa. The whole picture of Chinese overseas agricultural expansion in the early modern period remains an enigma.

While no systematic research has been done on early modern Chinese overseas agricultural expansion, the recent wave of regional studies that focus on the specific colonies under the VOC have often encountered this problem individually. In the case of Dutch Formosa, Tonio Andrade and Chiu Hsin-hui have discussed how Chinese agricultural settlement emerged there, and Lin Wei-sheng has studied the sugar trade of Dutch Formosa.[1] For the Ommelanden of Batavia, Remco Raben has compared it with the rural society of Colombo with reference to Chinese sugar plantations, Hendrik E. Niemeijer explored some of the most original sources in the National Archives of Indonesia (ANRI) about the sugar economy of the Ommelanden in the seventeenth century, and Bondan Kanumoyoso has a chapter about sugar society in his Ph. D. dissertation on the Ommelanden of Batavia for the period before the Chinese massacre in 1740.[2] In western Java, Ota Atsushi's monograph on Banten has pointed out the interesting extension of Chinese sugar frontier from Ommelanden to Tangerang in the post-Chinese massacre period.[3] Kwee Hui Kian also referred to a contemporary development on the northeast coast of Java.[4]

These researches shed light to the local context of each Chinese sugar frontier and form the foundation for a further study to combine and compare individual cases and to figure out the gaps in-between. To certain extent, this study stands on the shoulders of these precursors

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[1] Tonio Andrade, *How Taiwan Became Chinese: Dutch, Spanish, and Han Colonization in the Seventeenth Century* (New York: Columbia University Press, 2008); Chiu Hsin-Hui, *The Colonial 'Civilizing Progress' in Dutch Formosa, 1624-1662* (Leiden and Boston: Brill, 2009); Lin Wei-sheng 林偉盛, "Heju Shiqi de Taiwan Shatang Maoyi" 荷據時期的台灣砂糖貿易 [The sugar trade of Taiwan during Dutch period], in *CaoYonghe Xiansheng Bashi Shouqing Lunwen Ji* 曹永和先生八十壽慶論文集 [Papers compiled in honor of the eightieth birthday of Mr Cao Yonghe] (Taipei: Lexue shuju, 2001).

[2] Remco Raben, "Batavia and Colombo: The Ethnic and Spatial Order of Two Colonial Cities, 1600-1800" (Ph. D. dissertation, Leiden University, 1996); Hendrik E. Niemeijer, *Batavia: Een koloniale samenleving in de zeventiende eeuw* (Amsterdam: Uitgeverij Balans, 2005); Bondan Kanumoyoso, "Beyond the City Wall: Society and Economic Development in the Ommelanden of Batavia, 1684-1740" (Ph. D. dissertation, Leiden University, 2011).

[3] Ota Atsushi, *Changes of Regime and Social Dynamics in West Java: Society, State and the Outer World of Banten, 1750-1830* (Leiden and Boston: Brill, 2006).

[4] Kwee Hui Kian, *The Political Economy of Java's Northeast Coast, c. 1740-1800: Elite Synergy* (Leiden and Boston: Brill, 2006).

and it attempts to take Chinese plantation society as a cross-regional theme which is based on but not bound by regional cases. This approach differs substantially from previous studies and would allow a thorough discussion on how the Chinese century was manifested at agricultural frontiers in the different territorial colonies across the Dutch Empire in Asia.

The Dutch Company and its rural institutions

During the research period of this thesis, the VOC was only able and perhaps only willing to establish and maintain a few number of territorial colonies in Asia, but this fact does not mean that the limited territory under the VOC is insignificant to the history of early modern Asia. This point can be testified in the entangled relation between the rise of overseas Chinese sugar plantations and the territorial governance of the VOC.

To begin with, most of the historians on European colonial expansion are actually not aware how strange the very term of "Chinese plantation society" would sound to a Chinese social historian. As Sucheta Mazumdar has repeatedly pronounced in her celebrated book that a major feature of the early modern Chinese sugar agro-agriculture is that there existed no sugar plantation society.[1] The cultivation and manufacture of sugar cane and sugar were organized on the basis of families or lineages, instead of plantations.[2] But, in the Ommelanden of Batavia, that was not the case. Under the VOC, the organization of Chinese sugar agro-industry had been fundamentally transformed into a plantation economy.

How could that transition happen? One might argue that, due to the maritime policy of the Chinese imperial states, the Chinese, who moved from China to the Dutch East Indies, were mainly male. That imbalance of sexuality made the overseas Chinese unable to form stable familial and kinship relationship in a fluid agricultural frontiers society. That explanation however cannot explain why, after many generations, there were still no settled Chinese villages in the Ommelanden to engage in sugar agro-industry in a "Chinese way". That question requires a further consideration of the institutional nature of the Dutch Company, which functioned, on the one hand, as a commercial company with world-wide networks that provided a protected market to promote Chinese emigrants to open sugar frontiers, and, on the other, as a territorial state with unique rural institutions that led these Chinese agricultural immigrants to be organized in a non-familial, plantation society.

[1] Mazumdar, *Sugar and Society in China*.
[2] Ibid.

Admittedly, the dual institutional nature of European overseas companies as both commercial organizations and political bodies is not new to colonial historians,[1] but that nature is yet to be examined in a rural and plantation context and that missed perspective has become increasing in-ignorable in the recent constitutional turn of the studies on the European overseas companies. In the studies of the English East India Company, scholars have articulated that the English Company had become a state long before the battle of Plassey (1757).[2] That state had its own constitution granted by the crown which partly formed the sovereignty of that company, and that company-state was largely independent of the English state.[3] Against this backdrop, Dutch historians are also willing to accept such a turn and have argued that the VOC was also equally a company-state although its sovereignty was not derived from a crown but was linked with the Dutch Republic.[4] However, an intriguing difference between the EIC and the VOC that has been missed in these discussions is: Whereas, before its military success in Bengal in the 1750s, the EIC had barely controlled any territory beyond the city-walls of their trading posts; the VOC had in fact controlled substantial territories and had begun to establish governance in some expanding commodity frontiers on Formosa and Java as early as the 1630s. The different origins of the sovereignty of these European companies notwithstanding, the VOC had practiced as a real terrestrial ruler in Asia with its own rural society much earlier than the EIC. In that sense, it is would be perhaps more pertinent to define the pre-Plassey EIC as a *non-territorial* company state, and the VOC as *territorial*.

The existence of the VOC as a *territorial* company state, in my opinion, was a major factor that contributed to the transformation of Chinese sugar agro-industry from small-householder economy to plantations in the Dutch East Indies. On the one hand, unlike the EIC or other contemporary port-states in the East Indies, the VOC were able to control large rural areas to attract exogenous planters and labourers to make up plantation economy. On the other hand, unlike the Chinese imperial states or other territorial empires in Asia, the Dutch Company was not really interested in land and poll tax in the rural society but was highly

[1] For instance, this theme had been discussed by a groups historians who were from the studies of different Euroopean overseas companies in a volume dated 1981. Leonard Blussé and Femme Gaastra, *Companies and Trade: Essays on Overseas Trading Companies during the Ancien Régime* (Leiden: Leiden University Press, 1981).

[2] Philip J. Stern, *The Company-State: Corporate Sovereignty and the Early Modern Foundations of the British Empire in India* (Oxford, Oxford University Press, 2011).

[3] William A. Pettigrew, "Corporate Constitutionalism and the Dialogue between the Global and Local in Seventeenth-Century English History," *Itinerario* 39:3 (2016): 487–525.

[4] Arthur Weststeijn, "The VOC as a Company-State: Debating Seventeenth-Century Dutch Colonial Expansion," *Itinerario* 38:1 (2014): 13-34.

sophisticated in obtaining monopolistic profit of the commodities produced there. This is the case that had already happened immediately following the conquest of the Banda Islands in the 1620s, where a strange "plantation" system (*perkeniers*) was first established. In that system, the VOC monopolized the output of nutmeg and mace, and strictly prohibited the expansion of spice cultivation into other islands.[1]

The rise of sugar cultivation since the 1630s in Formosa and Batavia resembled that pattern in terms of the VOC's interests on regulating and monopolising commodities but differed from that in terms of the expansive nature of these sugar frontiers. Whereas the *perkeniers* in the Banda Islands were mainly based on the cultivation of nutmeg trees in the Banda Islands which had existed long before the occupation of the VOC and they were also strictly prohibited by the Company to expand cultivation beyond these tiny islands,[2] the Chinese agriculturalists on Formosa and Batavia were opening new and, virtually, unending frontiers on those large islands.

In those unending sugar frontiers, the VOC could either encourage Chinese immigrants to settle down in a self-sustainable agricultural colony, or otherwise let them be organized in a fluid and market-oriented plantation society. The former was successfully practised in Dutch Formosa in the 1640s and 1650s, but that success would eventually hurt the Company deadly as the settled Chinese colony in Formosa was eventually incorporated into a Chinese state in 1662. The latter pattern firstly emerged in the Ommelanden of Batavia also in the middle of the seventeenth century and that pattern would be spread to the rest of Dutch Java in the second half of the eighteenth century and became the norm of the Chinese sugar frontiers in the Dutch territorial company-state. The nature and process of this transition will be a major focus of this thesis.

Human agents who brought together distinctive traditions

On the one hand, there was the unique rural institution of the Dutch Company, and, on the other, there was the unusual plantation society of the overseas Chinese. They were entangled not only because they structurally dovetailed each other, but also because there existed agents between them. Categorically, these agents can be divided into three groups, that is, the Chinese merchants, the European private traders, and the company personnel. Their respective niches in the sugar frontiers of the Dutch East Indies depended on their informal networks outside the Company and their formal positions in the Company.

[1] Loth, "Pioneers and Perkeniers: The Banda Islands in the 17th Century."
[2] Ibid.

Instead of being merchants without empire,[1] the Chinese merchants in the sugar frontiers were actually a kind of Asian agents who had close connections with the Dutch territorial company-state. Throughout the research period of this thesis, the Chinese Captains were usually among the largest land holders and sugar millers, and the other large Chinese sugar millers were also often connected with them as relatives or business partners. These Chinese elite played a crucial role in securing landownership, in negotiating advantageous sugar price with the Company, in restricting the competition of foreign sugar, and in settling disputes within the Chinese sugar plantation society. Although, there were only few sources directly left by them such as the archive of the Kong Koan of Batavia from the late eighteenth century, these Chinese merchants were actually an invisible hand in influencing the decisions made by the Council of the Indies because of their close relations with the members of that Council.

The role of European private traders was also elusive. Although an exceptional case indicated that there was a European merchant who set up a water-driven sugar mill and attempted to monopolize sugar production in the Ommelanden in 1662, there was not much evidence showing that they had been deeply involved in the sugar frontiers before the Chinese massacre in 1740. Thereafter, things began to change that on the one hand, the Company gradually opened intra-Asian sugar trade to private traders, and on the other, a number of European private traders set to transfer the technologies from the West Indies to the East and became landowners and planters in Dutch Java. Yet due to the time span of this research, that change will not be discussed in this thesis.

The place of the company personnel in the Chinese sugar frontiers is perhaps most intriguing. Although there was hardly an initiative among the Gentlemen Seventeen back in the Dutch Republic to expand the Company's authority beyond the city-walls, there existed strong personal interests among the company personnel in Asia to expand their business in the shadow of the Company. Such an expansion could either be towards the seas by impinging on the Company's monopoly of trade, such as what has been studied in Chris Nierstrasz' recent book;[2] or otherwise just to its opposite, that is, towards the hinterland by possessing farm land for economic benefits or owning luxurious gardens and estates, that is, the *buitenplaatsen*, for pleasant social life. It is these landed interests which have been ignored in the previous researches of the agency issues in the Company and will be discussed in this study.

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[1] Wang Gungwu, "Merchants without empire: the Hokkien sojourning communities," in *The Rise of Merchant Empires: Long Distance Trade in the Early Modern World 1350-1750*, ed. James D. Tracy, (Cambridge: Cambridge University Press, 2011).

[2] Chris Nierstrasz, *In the Shadow of the Company: The Dutch East India Company and Its Servants in the Period of Its Decline, 1740-1796* (Leiden: Brill, 2012).

All above-mentioned issues will be discussed in the three chapters of this thesis. The first chapter will show, before the emergence of Sino-Dutch sugar frontiers, how cash-crop agriculture was evolving in the Netherlands and on the southeast China coast. Thereafter, the remaining two chapters will examine how these different traditions came together and contributed to the making of Sino-Dutch sugar frontiers in early modern Asia. Specifically, chapter two will present how Chinese sugar frontiers firstly emerged in the Ommelanden of Batavia and in Saccam of Dutch Formosa in the 1630s, and how the Chinese in the Ommelanden developed a plantation society, whereas those in Saccam built a settlement colony in the 1640s-1650s. After the Chinese settlement colony in Formosa became a part of a Chinese state in 1662, the focus of chapter three will shift to the Ommelanden and it will show how that sugar frontier recovered from a nadir in the 1660s and 1670s, and experienced boom and sustained prosperity in the period from 1681-1734.

The majority of the sources to be used in these three chapters are from the archives of the VOC in Den Haag and Jakarta. These sources left by the Dutch Company are not monolithic. The decisions made by the Council of the Indies in Batavia were often contradictory to the orders sent by the Gentlemen Seventeen from the Netherlands, and the governance by the rural institutions on ground, such as College of Heemraden, would again be different from the decisions by the higher governments. More diversified voices can be found in pamphlets made by the European agents, survey reports commissioned by the company, essays by the contemporary European sugar entrepreneurs in an journal published in Batavia, and last but not least, some few Chinese sources left by Chinese elites in Batavia.

The challenge and attraction of doing this research are how to unveil the nature of that rural society by linking up these diverse sources which were produced by the ruling classes instead of the rural society itself, and how to compare that society with the better-known case of the sugar economy in the West Indies and China. The first problem is not new for social historians. The best answer is that researchers should always be aware of the bias in these colonial documents and to critically compare information given by different institutions and individuals. The second point is in fact a major attraction that motivated me to do this research at the very beginning. It is because the Sino-Dutch sugar frontiers in the Ommelanden and Formosa represented a convergence of influence from Europe and China, which offered a unique example to rethink some of our entrenched concepts of the agriculture and commerce at the two ends of Eurasia.

1. Before the frontiers: Agriculture and Commerce at the two ends of Eurasia

Before the emergence of the Sino-Dutch sugar frontiers in early modern Asia, the rural society of the Dutch Republic and southern Fujian had the most commercialized agriculture in the most advanced economies at the two ends of Eurasia. Both specialized on certain kinds of cash crops which yielded high economic return and both had also became heavily reliant on the supply of grains from elsewhere. In the case of the Dutch Republic, the commercialization of agriculture was featured of strong influence by urban interests which had penetrated into the rural society of the northern Netherlands since the Dutch Revolt and which had also begun to control overseas plantation economies through two gigantic chartered companies since the early seventeenth century. On the southeast coast of China, there lacked such powerful urban interests, but its agriculture was commercialized at a comparable level, which was manifested in the wide cultivation of cash crops such as sugar, indigo, and tobacco. For instance, benefiting from its favourable climate and its new sugar-making technology, southern Fujian had become the centre of Chinese sugar production in the sixteenth century. By introducing these two developments, this chapter aims to investigate the origins of several critical elements which would later contribute to the making of the Sino-Dutch sugar frontiers in Dutch Java and Formosa. These elements include the strong influence of urban and commercial interests over agriculture in the Dutch Empire on the one hand, and the birth of Chinese-style sugar economy in Southern Fujian on the other.

1.1 The Dutch Empire: The strong influence of urban upon rural

In this research, the rural economy of the Dutch Empire in the early modern period deserves special attention for two reasons. 1) The core areas of that economy, that is, the maritime provinces of the northern Netherlands, was different from other well-known European cases. It lacked strong medieval feudalism tradition and it had become under strong influence of the urban interests since the Dutch Revolt. 2) Its overseas expansion in the tropical areas was not accompanied by mass emigration of Dutch agriculturalists and was built up on local traditions.

These two features had already become prominent in the first half of the seventeenth century. In the maritime provinces of the northern Netherlands, there was a wave of investment in the reclamation of polders by commercial interests and there also emerged continuous interests among the urban elite on the construction of *buitenplaatsen* in the rural area. In terms of the overseas expansion, the occupations of the Banda Islands by the VOC in the 1620sand the invasion of the northeast coast of Brazil by the WIC in the 1630s testified

how Dutch commercial and urban interests attempted to copy their experience from the Netherlands to control plantation economy in diversified overseas context.

1.1.1The urban-rural relations in the northern Netherlands

The urban-rural link in the northern Netherlands should be understood by its changing balance of power among nobles, farmers and burgers in the period around the Dutch Revolt. Since the medieval period, the rural areas of the maritime provinces of the northern Netherlands had three kinds of landowners, the nobles, the farmers, and the urban interests. Before the Dutch Revolt in the 1570s, the citizens and institutions in the cities did not have much influence on the agricultural development in the rural. The reclamation and maintenance of polders were mainly a local issue organized by the self-standing farmers and nobles in the rural,[1] and the main market of their products was not in the cities of the northern Netherlands but in the then economic centres in the southern Netherlands.[2]The wars and religious persecutions during the Revolt changed that relation. Most nobles lost their political power because of their allegiance to the Catholic king of Phillip II.[3]The farmers in the rural areas were frequently suffering from pillages by marching armies, man-made floods by defending parties, and cessation from their orient market in the southern Netherlands.[4]The winners were the upper class of the burgers who controlled both political and economic power in the newly founded Dutch Republic, and who also began to wield increasing influence in the rural economy. That influence was on the one hand facilitated by the development of cadastral survey which allowed capitalized reclamation of polders by urban interests, and, on the other, enhanced by the rise of *buitenplaatsen* which represented the changing life style of the urban elites to prefer to live in their country houses.

In the history of cadastral survey, the early modern Dutch Republic stands out by reason of its remarkable success in making very early mapped land survey.[5] This kind of land survey has its long tradition which can be traced back to the medieval period, but not until the sixteenth century, mapped land survey began to spread widely in the polder areas of the

[1] Jan de Vries and Ad van der Woude, *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500-1815* (Cambridge: Cambridge University Press, 1997), 201.
[2] Ibid.
[3] Idem, 507.
[4] Idem, 201.
[5] Roger J.P. Kain and Elizabeth Baigent, *The Cadastral Map in the Service of the State: A History of Property Mapping* (Chicago and London: The University of Chicago Press, 1992), 9.

northwest Netherlands.[1] It was accompanied with a sea change of the characteristic of land reclamation, that is, from defensive polder building to offensive.[2] The process was most prominent in the early seventeenth century when urban investors from commercial centres such as Amsterdam began to jointly fund the construction of large-scale polders in a way very similar with what they had practised in the creation of the VOC. In this development, land surveyors and their maps played a critical role.

Before the rising of capitalist land reclamation in the early seventeenth century, land survey was mainly commissioned by a local organization called *waterschap*, which was an institution of Dutch rural society in charge of water management.[3] In Holland, it usually consisted of a *dijkgraaf* (dike warden), a representative of the count of Holland, and a number of *heemraden*, who were from the inhabitants who lived in the polder.[4] Although it had a representative of government, this organization largely functioned as an autonomous body which exerted legal authority in the polder, such as to maintain the facilities of the polder, to solve conflicts surrounding drainage and water rights, and to punish offenders who endangered the polder.[5]

In some areas, these local organizations had been amalgamated into larger units, which were called *hoogheemraadschappen*.[6] Some *hoogheemraadschappen*, such as those of Rijnland, Schieland, Delftland, and Amstelland, had existed since the thirteenth century.[7] In order to coordinate their complicated water systems, to resolve disputes surrounding land boundary, and to collect land taxes, these *hoogheemraadschappen* began to commission systematic land survey in the sixteenth century.[8] This wave of survey was also helped by the invention and spread of new cartographic technologies, such as triangulation, among surveyors.[9] For instance, in 1539, the *hoogheemraadschap* of Delftland ordered the famous cartographer, Jacob van Deventer, who was among the first to apply the technology of

[1] Cornelis Koeman and Marco van Egmond, "Surveying and Official Mapping in the Low Countries, 1500 - ca. 1670," in *The History of Cartography* Vol 3. Cartography in the European Renaissance, ed. David Woodward (Chicago: University of Chicago Press, 2009), 1253-1255.
[2] C. P. van de Ven ed., *Leefbaar laagland: Geschiedenis van de waterbeheersing en landaanwinning in Nederland* (Utrecht: Matrijs, 2003), 143; De Vries and der Woude, *The First Modern Economy*, 27.
[3] Kain and Baigent, *The Cadastral Map in the Service of the State*, 11-12.
[4] Ibid.
[5] Ibid.
[6] Ibid.
[7] Ibid.
[8] Idem, 12-19.
[9] Koeman and Egmond, "Surveying and Official Mapping in the Low Countries, 1500 – ca. 1670," 1255.

triangulation, to survey and draw a map of the whole area under its authority.[1] In the following decades, other *hoogheemraadschappen* also followed, and by 1615, all of the three largest *hoogheemraadschappen*, Rijnland, Delftland, and Schieland, had printed their polder maps.[2]

Whereas the land survey by these *hoogheemraadschppen* was largely initiated and organized by the existing institutions of the rural society of the Netherlands, the early seventeenth century would witness a new kind of land survey which was similar in technology but its nature had been changed. The system behind these surveys was no longer aiming to map the existing polders, but had a clear agenda to create polders by using maps.

The Beemster Polder (built in 1612) is the best-known among others. This polder was originally a lake in north Holland. Some merchants who were living in Amsterdam found it would be profitable if this lake could be drained and constructed into a polder with the help of newly designed windmills.[3] Before the windmills were installed and ditches were dug, surveyors were commissioned to produce a *perfecte caerte* (perfect map) of the lake.[4] On that map, not only natural features and infrastructure were drawn and designed, but also artificial boundary was made and many plots of land were numbered.[5] With the help of the cadastral map, the polder had been partitioned before it came into existence.

[1] Idem, 1257, 1266.
[2] Idem, 1267.
[3] Alette Fleischer, "The Beemster Polder: Conservative Invention and Holland's Great Pleasure Garden," in *The Mindful Hand: Inquiry and Invention from the Late Renaissance to Early Industrialisation*, ed. Lissa L. Roberts, Simon Schaffer, and Peter Dear (The Publishing House of the Royal Netherlands Academy of Arts and Sciences, 2007), 151.
[4] Idem, 154.
[5] Idem, 152-154.

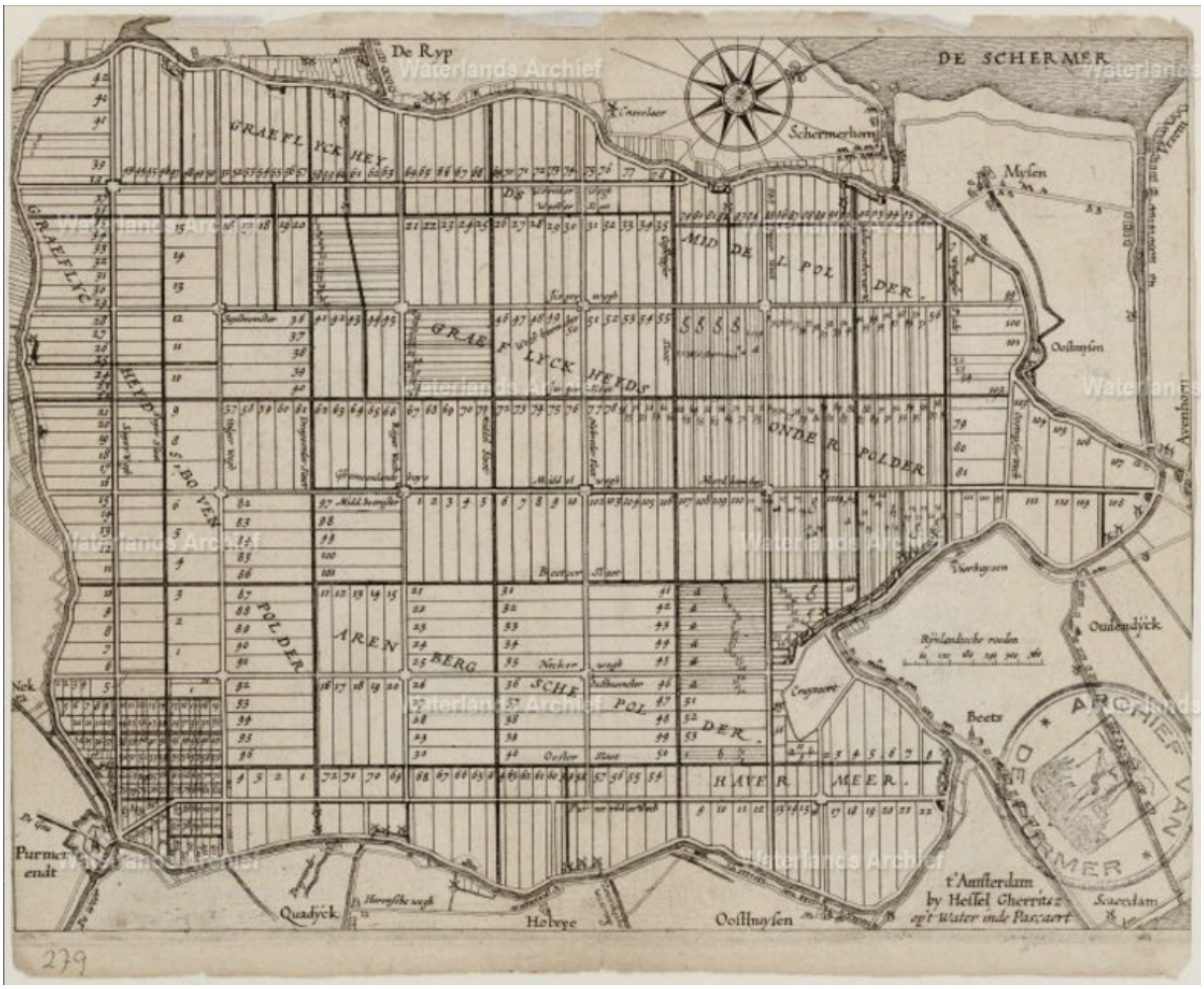

Illustration 1. Beemster, 1612, Waterlands Archief, Purmerend inv.nr. 279.

The investors behind the drainage of Beemster had a clear idea of how to capitalize asset and how to sell it in a financial market by dividing a huge asset into many stakes. This system had already been practised in the creation of the VOC in 1602 and the experience was passed down. Among the first investors of Beemster were the wealthy merchant brothers, Dirck and Hendrik van Os, who were also co-founders of the VOC.[1]

Beemster was not the only case. Besides it, there were Wieringerwaard (1597), Wogmeer (1608), Wormer (1624), Schermer (1635), and so forth.[2] According to the research by Jan de Vries and Ad van der Woude, in a short period from 1610 to 1640, "[l]eading Amsterdam merchants and other urban interests then dared to plunge at least ten million guilders – far more than they and their contemporaries had invested to establish the Dutch East India Company in 1602 – into the application of new windmill pumping techniques to the drainage of a series of lakes covering in total 26,000 hectare."[3] In this process, we can imagine how

[1] Idem, 151-152.
[2] De Vries and der Woude, *The First Modern Economy*, 28.
[3] Idem, 29.

much money had been invested for plots of land that were at first only existing as lakes on land maps, just as how much capital had been raised for the trading companies whose activities and privileges were initially only visible on maritime maps.

The enormous investment of land reclamation with the help of cadastral maps did not last long. In Holland, the level of reclamation receded dramatically after the 1640s.[1] It is because on the one hand, the marginal return was diminishing as the remaining unclaimed lakes were too deep to be profitably drained; and on the other, the agriculture boom was over and the urban merchants began to prefer other investments.[2] The ebbing tide of land reclamation in the Netherlands notwithstanding, many urban elite in the cities kept moving out to the countryside to enjoy pleasant lives in their *buitenplaatsen*.

The development of *buitenplaatsen* in the Netherlands was an urban initiative which was not much based on the manorial tradition of medieval Europe. The maritime provinces of the Netherlands lacked a strong medieval feudal heritage so that the pre-Revolt nobles in the rural society had at best moderate power in comparison with other European societies.[3] During the Dutch Revolt, that power was further weakened, as the whole noble class were enervated. By the seventeenth century, there were the upper-class of the burgers who began to construct their big houses in the countryside.[4]Although many of them were located near the farmland already owned by rich burgers, the rationale behind the investment of these houses was not only profit-oriented, but for healthy and cultural reasons such as avoiding the putrid smell which was common in the cities during summer, for building idealistic gardens which introduced exotic plants from overseas, and for demonstrating higher social class by distancing the rich owners of *buitenplaatsen* from other ordinary burgers.[5]

Either as an absentee landowner with surveyed maps or as a resident landowner in a splendid *buitenplaats*, the urban and commercial interests in the maritime provinces of the

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[1] Idem, 30.
[2] Kain and Baigent, *The Cadastral Map in the Service of the State*, 23.
[3] De Vries and der Woude, *The First Modern Economy*, 529-543.
[4] Erik de Jong, *Natuur en Kunst:Nederlandse tuin- en landschapsarchitectuur, 1650-1740* (Amsterdam: Uitgeverij Thoth, 1993), 33-34.
[5] Piet Emmer en Jos Gommans, ed., *Rijk aan de rand van de wereld: De geschiedenis van Nederland overzee 1600-1800* (Amsterdam: Uitgeverij Bert Bakker, 2012), 71-83; Rob van der Laarse, "Amsterdam en oranje: De politieke cultuur van kasteel en buitenplaats in Hollands Gouden Eeuw," in *Buitenplaatsen in de Gouden Eeuw: De Rijkdom van het buitenleven in de Republiek*, ed. Yme Kuiper en Ben Olde Meierink (Hilversum: Uigeverij Verloren, 2015), 68-95; Martin van den Broeke, "Het profijt voorop? Landbouwbedrijf op buitenplaatsen in Zeeland (1609-1672)," in *Buitenplaatsen in de Gouden Eeuw: De Rijkdom van het buitenleven in de Republiek*, ed. Yme Kuiper en Ben Olde Meierink (Hilversum: Uigeverij Verloren, 2015), 130-153.

Netherlands had steadily penetrated into the rural society since the Dutch Revolt. The next question is how that connection was built in their overseas empire.

1.1.2Dutch Empire's early encounters with plantation economies

The overseas expansion of the Dutch Empire was not only a sea-borne endeavour. Instead, since its initial stage, it had developed territorial control upon tropical cash-crop agriculture in two strategic areas. In the Banda Islands, the VOC developed the *perkenier* system and surveyed the land allocated to each *perk*. In Dutch Brazil, the WIC lacked such kind of sophisticated land control, but it tried other ways to establish a link between the company and its rural sugar plantations. In the rest of this section, I will first discuss the *perkenier* system in the Banda Islands and then introduce and make comparison with the sugar plantations in Dutch Brazil.

In the last decades, there is a debate on the nature of the *perkenier* system in the Banda Islands. The central issue of that debate is whether that system resembled the sugar plantation system in the Atlantic or was part of Asian traditions. Vincent C. Loth holds that the institutions and society designed by the VOC in the Banda Islands marked a unique development in early modern Asia. The VOC under the leadership of Jan Pieterszoon Coen first uprooted the original political and social structure of the whole islands, then depopulated their population, and eventually introduced a completely new system, that is, the *perkenier* system.[1]That socio-economic system, in Loth's own words, "was rooted in the same European concepts, or set of ideas, that lay at the basis of Central American island economies."[2] Opposite to this interpretation, Philip Winn holds that the alien *perkenier* system, which was initially forcefully introduced by the VOC, had rather quickly became consistent with its surrounding local societies and with the general Asian traditions. The *perkeniers*, who were expected by the VOC to produce nutmeg and mace, actually had more interests in local trade; the slaves, who were assigned by the VOC for spice productions, were assigned by the *perkeniers* for household service and commerce; and even the technology and management of spices were largely passed down by the surviving Bandanese.[3]

In my opinion, it is indeed difficult to draw a clear boundary between these vaguely defined Atlantic or Asian traditions, since the *perkenier* system had both absorbed elements from Dutch influence and, at the same time, maintained a link with its own past and its

[1] Loth, "Pioneers and Perkeniers: The Banda Islands in the 17th Century."
[2] Idem, 35.
[3] Winn, "Slavery and Cultural Creativity in the Banda Islands."

regional network. To examine how these two traditions converged, we should precisely focus on how the changes brought by the VOC were localized in Banda.

Before Coen's full scale conquest in 1621, the cultivation and export of nutmeg and mace were controlled by an oligarchy of elders, the *orangkaya*. By then, there was no king ruling above them.[1] These *orang kaya* were the leaders of local society. They possessed slaves and collectively commanded coastal communities to cultivate nutmeg trees, from whose fruits nutmeg and mace were produced.[2] It was the misunderstanding and conflicts of interests between the VOC and the *orang kaya* which gradually led to a series of wars since 1609 and eventually Coen's massacre and mass-deportation in 1621.

In these wars, the islands which were conquered by the VOC were depopulated, but their nutmeg trees still stood there and waited to be cared and harvested by new cultivators. It was against that background, the *perkenier* system was introduced to resume the production of the existing cash crops back to the old level. In that system, the VOC recruited burgers who were usually former employers of the company to be the planters *(perkeniers)* of the divided nutmeg orchids (*perken*).[3]

These burgers-turned *perkeniers* were not agriculturalists but were previously merchants, seafarers, or soldiers who served the company. The duty they assumed was also not to personally cultivate the nutmeg trees, but to make sure their slaves could collect a certain amount of qualified nutmeg and mace and to control the running cost of their *perken* to a sustainable levels.[4] The residence of *perkeniers* was often in the town near the Fort Nassau of Banda Neira.[5] They engaged in local trade and enjoyed luxurious life like the rich burgers in the Netherlands, while often entrusted the management of their *perken* to their slaves.[6]

Being aware of the lack of expertise of nutmeg cultivation among *perkeniers*, the VOC distributed the surviving Bandanese who possessed knowledge as slaves to the *perken* and also continuously supplied them with slaves from elsewhere.[7] These slaves were the backbone of nutmeg and mace production and some of them even often got opportunity to perform regional trade on behalf of *perkeniers*. As noted by Winn, that development made the slavery

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[1] John Villiers, "Trade and Society in the Banda Islands in the Sixteenth Century," *Modern Asian Studies* 15:4 (1981): 723-750.
[2] Ibid.
[3] A *perkenier* was not a real owner of a *perk*. He was not granted the ownership of the nutmeg orchid assigned by the VOC, but was treated as a *leenheer* (tenant-vassal) of the VOC. Willard A. Hanna, *Indonesia Banda: Colonialism and Its Aftermath in the Nutmeg Islands* (Philadelphia: ISHI, 1978), 59.
[4] Ibid.
[5] Idem, 81.
[6] Ibid.
[7] Winn, "Slavery and Cultural Creativity in the Banda Islands," 368-369.

in the *perkenier* system very different from that in Atlantic sugar plantations, since it allowed slaves much more mobility.[1]

Another link between *perkenier* system and Dutch agricultural tradition back home was related with cadastral maps. The exact date of the cadastral survey in Banda is not well documented, but some original cadastral maps survived and witnessed its early stage. Those maps were privately kept by Artus Gijsels, who was the Councillor of the Indies and the Governor of Ambon in the 1630s.[2] According to these maps, latest by the 1630s, the VOC had surveyed the whole Banda Islands and had partitioned nutmeg land into allotments for the *perkenier* system. Each allotment was marked by a letter which should have been accompanied by a registry. The boundaries of these partitioned lands were also drawn, but the direction and length of each line were absent. Lack of any other measurement, the only indication of the size of each *perken* was the number of slaves associated with it. That number varied enormously from 6 to 105 in the case of the western part of the largest island in Banda, the Lonthor island.

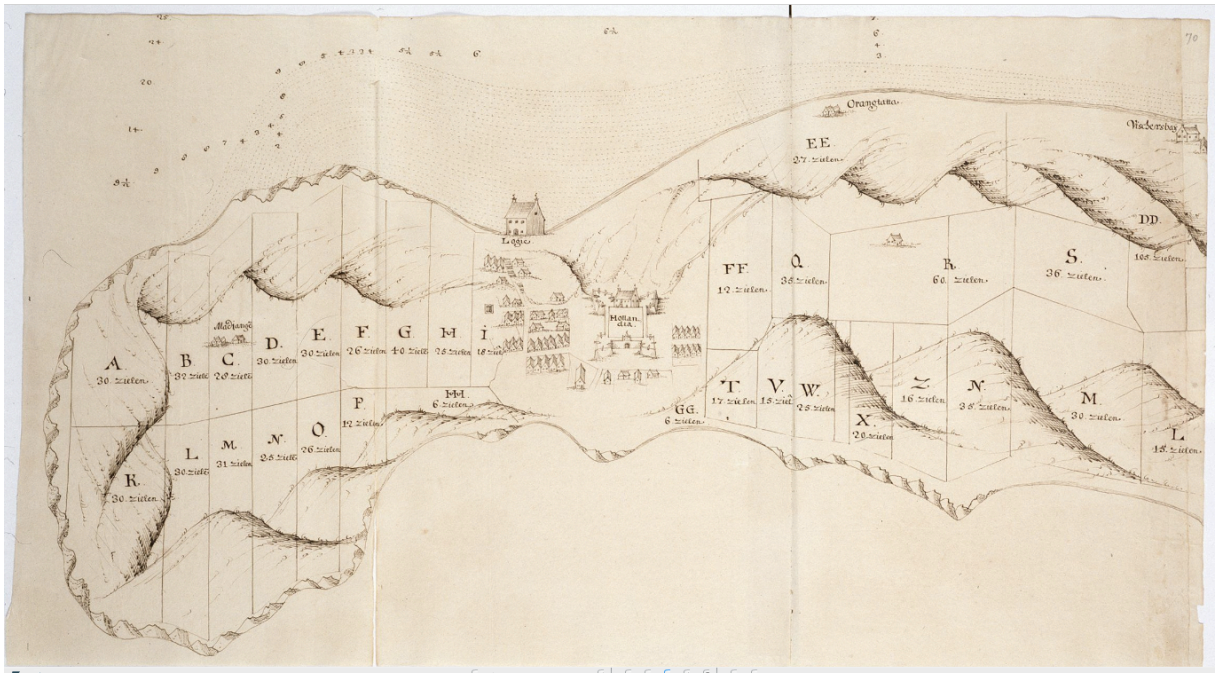

Illustration 2. Map of the western part of greater Banda or Lontor, ca. 1637, Badische Landebibliothek, K477 Fols. 69-70, available online: http://www.atlasofmutualheritage.nl/en/Map-eastern-part-Groot-Banda-Lonthor.6518 (accessed 10 July, 2017).

In comparison with the experience in the Banda Islands, the Dutch Empire's encounter with the Portuguese sugar plantation system in Brazil was of another nature. Where as the

[1] Idem, 365-389.
[2] M. A. P. Meilink-Roelofsz, "The Private Papers of Artus Gijsels as Source for the History of East Asia," *Journal of Southeast Asian History* 10:3 (1969): 540-559.

cultivation of nutmeg trees was limited to several tiny islands in Banda and had been only further constrained by the VOC; the sugar plantations in Brazil were an integral part of a highly expansive system which spread all the way from the Mediterranean to the New World.

Before the WIC's campaigns in Brazil, the Portuguese had transferred their sugar agro-industry from the Atlantic islands to coastal Brazil since the mid-sixteenth century. The sugar production in Brazil was at the beginning an extension of sugar production from the Atlantic islands such as Madeira, Canary Islands, and São Tomé. That migration was motivated by the growing consumption of sugar in northern Europe which demanded more sugar from new frontiers, on the one hand, and, on the other hand, was forced by the declining soil fertility of the small Atlantic islands, and allured by endless unclaimed land in Brazil.[1]

Along with sugar, what was introduced by the Portuguese into Brazil was also a unique social and political system for sugar production. The sugar complex, with its typical feature of large-scale plantations laboured by imported African slaves, was gradually taking shape in the cross-Atlantic migration.[2] In early seventeenth century Brazil, that pattern was close to completion. As marked by Curtin, "[t]he economy was now highly specialized, concentrated on a single crop, with most labour done by slaves-though many of the slaves were still Indian, not Africans".[3] The last step towards the mature form of the sugar complex which had yet to be taken by Brazil sugar was that the sugar cultivation and sugar milling in Brazil were still separate.[4] The integrated large-scale sugar plantations were awaiting the "sugar revolution" in Barbados in the 1640s.[5] Nevertheless, before the 1640s, such a large-scale sugar economy in Brazil had been able to occupy most of the sugar market in the Atlantic.[6]

Dutch connections with Brazil sugar was original based on their close trading relation. In the early seventeenth century, following the decline of Antwerp, the principal market of

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[1] Curtin, *The Rise and Fall of the Plantation Complex*, 27-28; 46-57.
[2] Ibid.
[3] Idem, 53.
[4] Stuart B. Schwartz, "A Commonwealth within Itself: The Early Brazilian Sugar Industry, 1550-1670," in *Tropical Babylons: Sugar and the Making of the Atlantic World, 1450-1680*, ed. Stuart B. Schwartz (Chapel Hill: The University of North Carolina Press, 2004), 185-187.
[5] There is a debate on whether that change can be labelled as a revolution. Richard S. Dunn, *Sugar and Slaves: The Rise of the Planter Class in the English West Indies, 1624-1713* (Chapel Hill: University of North Carolina Press, 1972); Barry W. Higman, "The Sugar Revolution," *Economic History Review* 53:2 (2000): 213-236; Russell R. Menard, "Law, Credit, the Supply of Labour, and the Organization of Sugar Production in the Colonial Greater Caribbean: A Comparison of Brazil and Barbados in the Seventeenth Century," in *The Early Modern Atlantic Economy*, ed. J. McCusker and K. Morgan (Cambridge: Cambridge University Press, 2001), 154-162; John J. McCusker and Russel R. Menard, "The Sugar Industry in the Seventeenth Century: A New Perspective on the Barbadian "Sugar Revolution"," in *Tropical Babylons: Sugar and the Making of the Atlantic World, 1450-1680*, ed. Stuart B. Schwartz (Chapel Hill: The University of North Carolina Press, 2004), 289-330.
[6] Schwartz, "A Commonwealth within Itself," 158-159.

Brazilian sugar shifted to Amsterdam, whose growing sugar refineries processed Brazilian raw sugar to feed the consumer market in north-western Europe.[1] Between Amsterdam and Brazil, there was an intricate sugar network weaved by merchants which circumvented the mercantilist policies of the then combined Spanish-Portuguese Empire.[2] Hence, the Dutch were no strangers to Brazilian sugar, although they had no experience on managing its plantations personally. The conquest of the WIC in the 1630s was the Dutch Empire's first encounter with sugar production. That experience was worth our special attention since it was connected with and also comparable with the development of the Sino-Dutch sugar frontiers in Asia in the succeeding period.

In general, the WIC had never seriously attempted to establish its own plantation system in Brazil and had also failed to maintain a sustainable relation with the Portuguese planters and sugar-millers in its rural society. The years immediately following the WIC's occupation of Recife in 1630 were marked by inconclusive conflicts between Portuguese planters and millers on the rural and Dutch occupants in the cities.[3] Not until 1637, the WIC could break Portuguese resistance in the hinterland and secure a peaceful period to resume sugar productions with the collaboration of Portuguese planters and millers.[4] During that period, the Governor General of Dutch Brazil, John Maurice, who was also the prince of Nassau-Siegen, had attempted to persuade the WIC to send German agricultural migrants, but that plan was never realized.[5]Instead, the WIC extended enormous credit to Portuguese planters and millers by supplying them African slaves in order to re-organize sugar production.[6] Those Portuguese planters became deadly indebted to the Company and began to revolt against Dutch rulers, who were also their creditors, after Maurice's departure from Brazil in 1644. Thereafter, Portuguese uprisings quickly swept across Dutch Brazil and things went out of control.[7] The WIC could only hold coastal cities and the vast hinterland was controlled by Portuguese planters who rebelled against the Dutch in order to get rid of debt.[8] The whole development in Boxer's word was "[t]he result was that the rural civilization of the *várzea* continued to be

[1] Idem, 173; Boxer, *The Dutch in Brazil*, 20-21.
[2] Christopher Ebert, *Between Empires: Brazilian Sugar in the Early Atlantic Economy, 1550-1630* (Leiden: Brill, 2008).
[3] Boxer, *The Dutch in Brazil*, 32-66.
[4] Idem, 67-111.
[5] Idem, 112-158.
[6] Schwartz, "A Commonwealth within Itself," 169-170; Boxer, *The Dutch in Brazil*, 112-158
[7] Ibid.
[8] Ibid.

dominated by the Portuguese planter and smallholder, whereas the Dutch officials, burghers, and merchants dominated the urban civilization of Recife and Mauritsstad".[1]

1.2 Southeast China coast: The cradle of Chinese sugar in maritime Asia

Comparable to the Dutch Empire in European historiography, the mountainous coastal area of southern Fujian has been long studied by historians as the centre of maritime China, from which the Minnan people (Hokkien) constructed their far-flung networks in East and Southeast Asia.[2] Yet an often ignored contemporary development in southern Fujian is that it had also become an agricultural centre from where Chinese sugar-making technology formed and was spread to the rest of East and Southeast Asia.

1.2.1 Southern Fujian as the centre of Chinese sugar

Southern Fujian's advantage in sugar production is a legacy of the long sugar-making tradition in Fujian. That tradition was initially most prominent in northern and central Fujian, but by the sixteenth century, the centre had been shifted to Southern Fujian where climate was more favourable and new technologies also firstly emerged.

In the previous researches by Christian Daniels, Sucheta Mazundar, Ji Xianlin, and Zhou Zhengqing, it has become evident that the sugar-making and refinery technology of China, as of other places, was a product of cross-cultural exchange.[3] It was firstly introduced around the eighth century by Buddhists from India. Thereafter, it reached a height during the Song period, when several renowned sugar-making centres appeared, such as Guanghan (Sichuan 广汉/四川), Shuining (Sichuan 遂宁/四川), Futang (Fuqing, Fujian 福唐(福清)/福建), Siming (Zhejiang 四明/浙江), and Panyu (Guangdong 番禺/广东).[4] After Song, Fujian, especially Southern Fujian, gradually became the forerunner. In the course of the fifteenth and sixteenth centuries, it integrated the "new agricultural methods, sugar case crushing, clarification and claying techniques" into "a technological package designed for efficient commercial

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[1] Idem, 144.
[2] Blussé, "Chinese Century: The Eighteenth Century in the China Sea Region"; Wang Gungwu, "Merchants without empire: the Hokkien sojourning communities."
[3] Christian Daniels, *Agro-Industries: Sugarcane Technology*; Mazundar, *Sugar and Society in China*; Ji Xianlin 季羡林, *Tangshi* 糖史[A History of Sugar] (Nanchang: Jiangxi Jiaoyu Chubanshe, 2009); Zhou Zhengqing 周正庆, *Zhongguo Tangye de Fazhan yu Shehui Shenghuo Yanjiu – 16 Shiji Zhongye zhi 20 Shiji 30 Niandai* 中国糖业的发展与社会生活研究——16 世纪中叶至 20 世纪 30 年代 [A study on the development of Chinese sugar and social life, 1550s to 1930s] (Shanghai: Shanghai Guji Chubanshe, 2006).
[4] Daniels, *Sugarcane Technology*, 88-93.

production in an expanding domestic market".[1]In the seventeenth and eighteenth centuries, this package would be diffused to other regions in East and Southeast Asia.[2]

The precocious development of Fujian sugar can be traced back to the period of the Southern Song dynasty (1127-1279). By then, Fujian had already stood as a sugar production and trade centre. It was complained by a local official, in the early thirteenth century, that the incessant export of sugar to Zhehuai (浙淮), which refers to the area around the lower Yangtze River delta, had become a threat to rice production in Xianyou (仙游) county, which was in central Fujian.[3] In a contemporary geographic book compiled by a local official serving the imperial customs (*shibosi*) of Quanzhou, sugar was listed among export items to several Southeast Asian countries.[4] By the end of that century, the travelogue of Marco Polo also described that great amount of sugar was available at Fuzhou.[5] Therefore, in the Southern Song period, Fujian, especial northern and central Fujian had already become a sugar production centre on the China coast.[6]

However, during the ensuing fourteenth and fifteenth centuries, there is barely any record on the development of the coastal and overseas sugar trade. Considering the historical context, it is likely that it was a result of the gloomy economy in the fourteenth and fifteenth centuries, when Fujian had been first devastated by a series of wars during the Song-Yuan-Ming dynastic transitions, and then restricted by the rigid sea prohibition policies of the early Ming period.[7]

After that depression, Fujian sugar resurged in the sixteenth century, but the locus had been shifted. Different from the early period, the centre of sugar production and trade had moved from the regions adjacent to the Min River (闽江) Delta, that is, Fuzhou area, and the regions between the Min River Delta and Southern Fujian, such as Fuqing (福清) and

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[1] Daniels, *Sugarcane Technology, 103-115.*
[2] Ibid.
[3] Fang Dacong 方大琮, *Tie'an Ji* 铁庵集[The Literature Collection of Tie'an](early 13th century), juan 21; Zhehuai(浙淮) in the Song period means the administrative units of Lianghuai(两淮) and Liangzhe(两浙), which encompassed the Jiangnan region; Xianyou(仙游) is a county between Southern Fujian and the Min River.
[4] Billy K. L. So, *Prosperity, Region, and Institutions in Maritime China: The South Fukien Pattern, 946-1368* (Cambridge (Massachusetts) and London: Harvard University Press, 2000),65-66.
[5]Ji Xianlin, *Tangshi*, vol. 1, 205-212.
[6] Although Quanzhou had begun to exported sugar, the production centre was still in Fuzhou during most of the Song period. Billy K. L. So, *Prosperity, Region, and Institutions in Maritime China*, 71.
[7] Billy K. L. So, *Prosperity, Region, and Institutions in Maritime China*, 122-127.

Xianyou (仙游); to Quanzhou (泉州) and Zhangzhou (漳州) in Southern Fujian. That development was noted in a provincial gazetteer, dated 1582, as follows.

"Sugar: manufactured in all prefectures, especially at Quanzhou and Zhangzhou; there are brown, white and candy sugar; merchants sold them to all directions; the cultivators of sugarcane are mostly from southern Zhangzhou [Zhangnan 漳南]; [they plant sugarcane] all around valleys; there is Ganzhe [namely, sugarcane] Island[甘蔗洲] in Houguan [候官], but no sugar [on that island] anymore."[1]

The former renowned centres such as Fuqing and Xianyou in central Fujian had been no longer been mentioned, and the confusing name of the Ganzhe Island of Houguan, which is in Fuzhou, was also clarified. Its emphasis on Quanzhou and Zhangzhou, as well as its indication of the cultivators from southern Zhangzhou (Zhangnan), suggests southern Fujian had taken over the leading position of the sugar agro-industry in Fujian.

This point can be further verified in a contemporary description of the native produce of Fujian, in which Quanzhou and Zhangzhou were specified as the places where sugar was exported.[2] Moreover, Zhangzhou sugar had earned good reputation beyond Fujian. In a late Ming commercial guidance, it was noted that "*mijian* 蜜煎 (candied food) is mostly from Suzhou [苏州] and Fujian, [but] sugar powder and sugar candy are from Zhangzhou prefecture, made in Fujian".[3] The massive export of sugar from southern Fujian caused sugar cane occupied lands previously for rice cultivation. It was recorded by a local official during the reign of Wangli (1573-1620) that "people grind [sugarcane] and boil it to be sugar, which is sold via seas; it has become less profitable to cultivate rice and more profitable to plant sugar cane so that people change paddy fields into sugarcane fields, and hence there is a shortage of rice".[4]

Such a geographical transition might be attributed to climatic change. Daniels notes: "[I]n Marco Polo's time Fu-Chou (福州) in Fukien thrived as a centre of sugar manufacture,

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[1] Wang Yingshan 王应山, *Minda Ji* 闽大记[The Chronicle of Fujian] (1581), juan 11.

[2] Wang Shimao 王世懋, "Minbu Shu" 闽部疏 [Discourse on Fujian] (1585).

[3] Yanling Chushi 延陵处士, comp., *Xinjin Jianghumichuan Shanggu Maimai Zhinan Pingshi* 新鍥江湖秘传商贾买卖指南评释[Newly Imprinted Comments on the Secret Stories and Commercial Trade Guidance] (Tanyi Yuwentai Zixingben 潭邑余文台梓行本), 39, quoted from: Xu Xiaowang 徐晓望, "16-17 Shiji Huan Taiwan Haixia Quyu Shichang Yanjiu" 16-17 世纪环台湾海峡区域市场研究 [Study of the Regional Market Surrounding Taiwan Strait in 16-17th Century] (Ph. D. diss., Xiamen University, 2003), 59.

[4] Chen Maoren 陈懋仁, *Quannan Zazhi* 泉南杂志[Journal of Southern Quanzhou] (early 17th century), juan shang, 7.

but by the 20th century sugar had ceased to be produced on the Min River for commodity production. Lower temperatures, as well as economic factors, may also have encouraged the demise of sugar manufacture on the Min."[1] Although there lacks reliable climatic data to show the historical temperature difference between Southern Fujian and the Min River, a general trend has been noted as that the climate of Fujian, in tandem with the rest of China, became colder throughout the Ming and Qing dynasty.[2] For instance, Fuzhou was the leading lychee cultivation region of Fujian in the Song period, but, during Ming and Qing, the north boundary of lychee cultivation had moved to central Fujian near Putian.[3]

1.2.2 The evolution of Chinese sugar-making technology

Along with the shift of the production centre to southern Fujian, there also appeared several critical innovations around that area. These innovations were essential to the efficiency and quality of Chinese sugar, which by the early seventeenth century had stood among the best in the world.

The most informative contemporary source on Chinese sugar-making technology is from *Tiangong Kaiwu* (天工开物[*The Exploration of the Works of Nature*]).[4] It was a Chinese encyclopaedia compiled by Song Yingxing (宋应星)and was published in 1637. That encyclopaedia gave a detailed account of how to make sugar from the selection of sugarcane seedlings to the crystallization of sugar candy. It demonstrated the state of art sugar-making technology in China which was also among the best in the contemporary world. Song made a clear point that technology could only be applied in the tropical and sub-tropical region of China, that is, Fujian and Guangdong. In these two provinces, southern and central Fujian was particularly important because of its connections with two critical technological breakthroughs in world sugar-making history, that is, the vertical roller mill and the claying technology.

The advent of the vertical roller mill was a major technological progress in the history of sugar-making and its earliest record was intriguingly linked with southern Fujian. Before the invention of vertical roller mill, Indians, Europeans and Chinese had attempted various ways, such as edge-runners, mortar and pestle, and tilt-hammers, in order to efficiently extract juice from sugarcane.[5] However, these methods were either too time or labour-consuming or had

[1] Daniels, *Sugarcane Technology,* 186.
[2] Lu Meisong 卢美松, ed., *Fujiansheng Lishi Ditu Ji* 福建省历史地图集[Historical Atlas of Fujian Province](Fuzhou: Fujiansheng Ditu Chubanshe, 2004), 285.
[3] Ibid.
[4] Song Yingxing 宋应星, *Tiangong Kaiwu* 天工开物[*The Exploration of the Works of Nature*](1637).
[5] Daniels, *Sugarcane Technology*, 284-302.

too low extraction rate.[1] The vertical roller mill marked a significant progress because it could efficiently crush unpeeled sugarcane and it allowed the juice to flow away from the bagasse when it was pressed through the rollers.[2]The origin of the vertical roller mill is obscure and has been subject to a debate between two prominent historians of Chinese sugar. Whereas Sucheta Mazumdar first claimed its origin was in India prior to 1540, and later changed it to the New World in the late sixteenth century, Christian Daniels holds Fujian was the original place of that invention.[3]However, the evidence is weak in both authors' claims. The first clearly dated documents referring to the vertical roller mill were an illustration of a three-roller vertical mill in Peru in 1613, and a description of the two-roller vertical mill from Sangleys, which means the Chinese from southern Fujian, in an early Spanish-Tagalog dictionary from the Philippines which is also dated 1613.[4] Merely based on those two distant evidence, it is too controversial to draw a conclusion of who invented it first and who influenced the other. A rather safe interpretation is that these sources indicate that southern Fujian had either independently developed that device because the record in the Philippine suggested it was introduced by people from southern Fujian, or southern Fujian had learned from the outside world, for instance Peru, thanks to southern Fujian's active role in Manila trade, which was further connected with the New World through the trans-Pacific connection.

The Chinese-style two-roller mill was illustrated in *Tiangong Kaiwu* as follows. It shows the vertical roller mill had two rollers and was driven by a buffalo. Its basis function was similar as the Portuguese mills in Dutch Brazil, but the latter had three rollers instead of two, and the latter could either be driven by animal power or water wheels, but the former was usually only powered by animal traction.[5]

[1] Ibid.
[2] Idem, 322-340.
[3] Sucheta Mazumdar, "A History of the Sugar Industry in China: The Political Economy of a Cash Crop in Guangdong, 1644-1834" (Ph.D. diss., University of California, Los Angeles, 1984), 110; John Daniels and Christian Daniels, "The Origin of the Sugarcane Roller Mill," *Technology and Culture* 29:3 (1988): 493-535; Mazumdar, *Sugar and Society in China*, 138-160.
[4] Mazumdar, *Sugar and Society in China,* 139; Daniels, *Sugarcane Technology*, 419-420.
[5] Schwartz, "A Commonwealth within Itself," 162-163; 178.

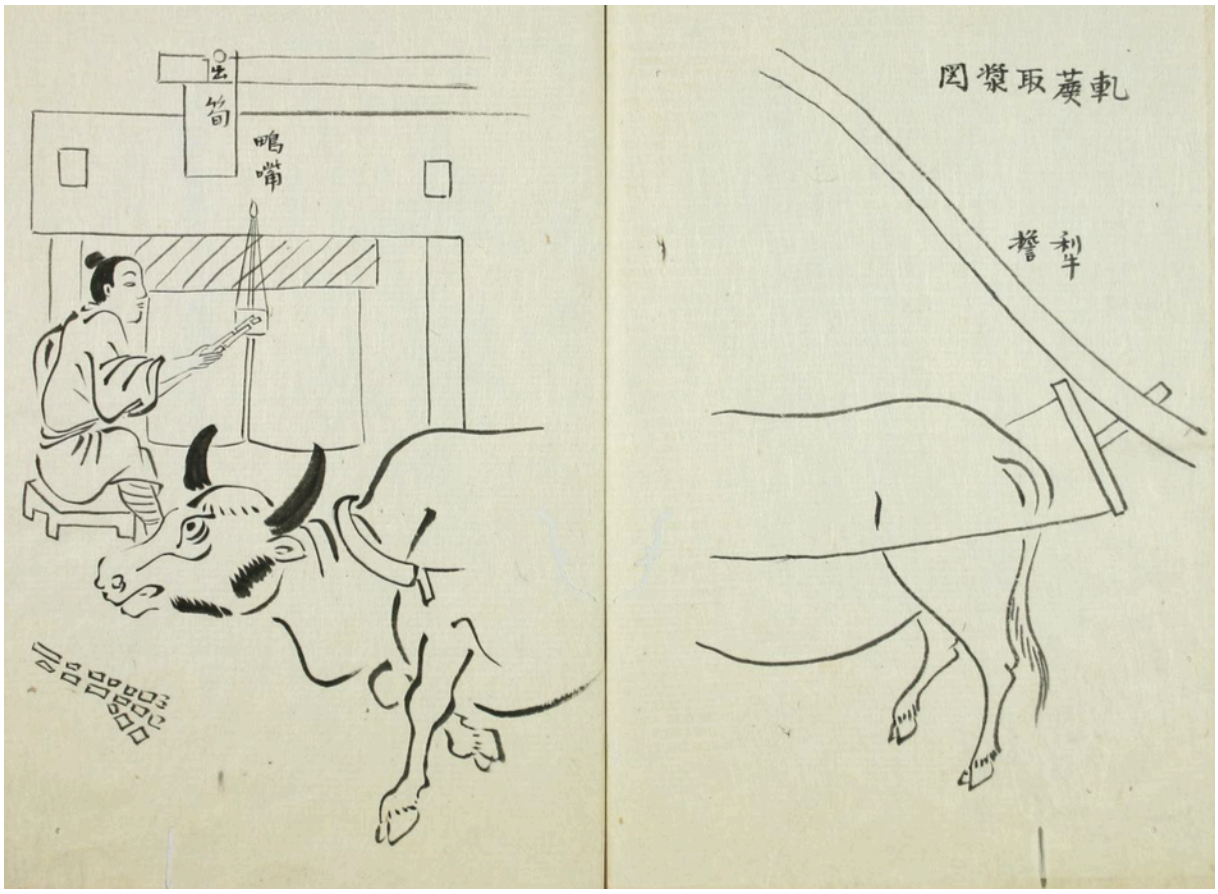

Illustration 3. Two roller vertical mill in Tiangong Kaiwu. Song Yingxing, Tiangong Kaiwu, "Ganshi Diliu"甘嗜第六.

Washing sugar with water from clay was another indispensable process in the making of white sugar in the early modern period, and in China that technology was an invention of Fujian according to Chinese sources. The basic process, as depicted by *Tiangong Kaiwu*, is that the artisan put boiled sugar syrup into a cone, which had a hole filled by grass, and stirred it for a while in order to help it crystallize. After sugar syrup cooled and crystallized sugar formed, the grass filling the bottom hole of the cone was removed and water with clay was poured into the cone. The water percolated through the cone and drained away molasses which covered crystallized sugar. By the end, the upper part of the drained sugar in cone became white sugar and the lower part was less white. That technology was also used in contemporary Brazil in the so-called purging house (*casa de purgar*), and the process was almost identical.[1] The origin of that technology is again obscure, and it likely has multiple origins.[2] In case of China, it was well documented that the process was firstly discovered

[1] Idem, 179.
[2] Daniels, *Sugarcane Technology*, 389-393.

accidentally in Quanzhou, southern Fujian, during the Yuan Dynasty (1271-1368), and its process had been recorded in great details in a gazetteer of Xinghua, central Fujian, in 1503.[1]

Illustration 4. Claying process in Tiangong Kaiwu. Song Yingxing, Tiangong Kaiwu, "Ganshi Diliu"甘嗜第六.

With these critical innovations, the sugar-making technology in southern Fujian had stood among the most sophisticated in the world and could be as efficient as that in contemporary Brazil, but there is no Chinese source permitting us a further enquiry of the social organization of sugar production in early seventeenth century southern Fujian in order to make a comparison with the well-known plantation society in Brazil. For the late period, the study made by Mazumdar has asserted that there had never been plantation society in early modern China where sugar production was instead organized in a smallholder economy.[2] However, the reality was actually much more diversified and nuanced, particularly when that agro-industry was expanded by Chinese emigrants into overseas agricultural frontiers.

[1] Ibid.
[2] Mazumdar, *Sugar and Society in China*.

2. The emergence of the frontiers: The dawn of two sugar islands in Asia (1636-1661)

In the period from 1636-1661, there emerged two sugar frontiers in the Dutch East Indies, Saccam of Dutch Formosa and the Ommelanden of Batavia. Both governed by the VOC, both linked with the crisis in Dutch Brazil, and both having a Chinese origin in southern Fujian, these two sugar frontiers had, nevertheless, experienced divergence from the very beginning. The two sections of this chapter first introduce how these two sugar frontiers, which would eventually develop into the two principal sugar islands in modern Asia, came into being in the late 1630s; and then discuss why they had already taken different paths in the 1640s and 1650s, when they were still under the same Company.

2.1 Taking advantage of Dutch Brazil, 1630s

In 1636, two prominent Chinese merchants in Batavia chose to take different paths and bade farewell to each other.[1] These two merchants, Ben Con and Jan Con, were close friends and shared similar background. Both of them were originally from southern Fujian, and both of them had been serving the VOC for long time. Yet by that moment, Ben Con decided to resign from the position of the Chinese Captain and return to China, and Jan Con first attempted to take over the position left by Jan Con. Ben Con's home trip eventual was aborted and it would only lead him to the Dutch colony in Formosa; and Jan Con's plan failed as well. These frustrations notwithstanding, almost simultaneously these two merchants turned their attention to a new adventure. Ben Con became one of the earliest Chinese leaders in promoting sugar and rice cultivation in Taiwan; while Jan Con invested heavily in sugar plantations and became the pioneer in opening sugar frontiers in the Ommelanden of Batavia. The divergent paths they took and the similar turns they experienced marked a critical step in the history of the Dutch East Indies, that is, a shift of attention from the maritime frontier to the agricultural frontier.

Instead of looking for an answer in Asia, the extension of the VOC from a trading empire to a ruler of sugar frontiers was at first initiated by a sudden disturbance of the Atlantic sugar market brought by the WIC's invasion of Brazil. Before 1636, the VOC had not seriously

[1] These two merchants have been studied individually by B. Hoetink and Leornard Blussé. B. Hoetink, "So Bing Kong. Het eerste hoofd der Chineezen te Batavia (1619-1636)," *Bijdragen tot de Taal-, Land- en Volkenkunde van Nederlandsch-Indië* 73(1917): 344-415; B. Hoetink, "So Bing Kong: Het eerste hoofd der Chineezen te Batavia: Eene nalezing," *Bijdragen tot de Taal-, Land- en Volkenkunde van Nederlandsch-Indië* 79(1923): 1-44; Blussé, *Strange Company*, 49-73.

considered to promote sugar cultivation in its own territory, but was dependent on the supply of sugar via intra-Asian trade from China, Bengal, Siam and Banten in order to satisfy the erratic demand from the Netherlands.[1] Among these sources, the Chines sugar was valued as the best, since, as mentioned in the previous chapter, it had already experienced several critical technological improvements around the fifteenth and sixteenth centuries in the area around southern Fujian.[2] The Dutch trading post in Formosa had been consistently importing sugar from southern Fujian since the late 1620s.[3] In the 1630s, that subtle balance of supply and demand was however broken by Dutch occupation of the northeast Brazil, the then principal sugar supplier in the Atlantic. The aggression of the WIC since 1629 firstly led to indecisive conflicts in the sugar production areas in Fernambuco and Bahia, which devastated sugar mills and caused acute depopulation.[4] To make the matters worse, from 1633-1638, the WIC's sugar trading policy swayed dramatically between monopoly and free trade for four times.[5] Consequently, the sugar market in Amsterdam was completely disturbed and had to look for sources from elsewhere, such as Asia. In these years, the VOC apparently increased its purchase of sugar. From 1633 to 1635, it ordered 600,000 pounds (4800 piculs) of powder and brown sugar yearly in Asia.[6] That figure climbed to 1,000,000 pounds (8000 piculs) in 1636, and in 1637, the VOC simply ordered unlimited purchase of sugar in Asia.[7]

2.1.1 Jan Con in the Ommelanden

Jan Con was an entrepreneur who had close connection with the Company, which was a pre-condition for a Chinese agent like him to take advantage of the remote troubles in the Dutch Empire. As a converted Muslim Chinese in Southeast Asia,[8] Jan Con had made remarkable contribution to the establishment of the Company's settlement in Batavia. He was among the first group of Chinese immigrants who moved from Banten to the newly-established headquarter of the VOC, Batavia, in 1619. There, he earned the favour of the Governor General, Jan Pieterszoon Coen, became a principal tax farmer and public work contractor for

[1] J. J. Reesse, *De suikerhandel van Amsterdam van het begin der 17de Eeuw tot 1813: Een bijdrage tot de handelsgeschiedenis des vaderlands, hoofdzakelijk uit de archieven verzameld en samengesteld* (Haarlem: J. L. E. I. Kleynenberg, 1908), 160.
[2] Glamann, *Dutch-Asiatic Trade,* 153; Daniels, *Agro-Industries: Sugarcane Technology*, 276-410.
[3] Lin Wei-sheng, "Heju Shiqi de Taiwan Shatang Maoyi," [The sugar trade of Taiwan during Dutch period], 15.
[4] Schwartz, "A Commonwealth within Itself," 166-172.
[5] Reesse, *De suikerhandel van Amsterdam*, 193-194.
[6] Idem, 161.
[7] Ibid.
[8] Blussé, *Strange Company*, 52.

the VOC, and once served as a broker in the peace negotiations between the VOC and Banten.[1] By the time of 1636, Jan Con as an established merchant in Batavia had already accumulated enough capital and social capital to extend his business beyond the city walls.[2]

In addition to his connections with the VOC, Jan Con had another advantage to start sugar cultivation, that is, his Chinese background. In his previous career as the contractor of the public project for the VOC, he had been familiar with the recruitment of Chinese coolies who arrived via Chinese junks every year.[3] He also personally returned to China in the late 1620s in order to help his friends and relatives to rid the persecution by the Chinese government, who suspected Jan Con was helping the VOC in marauding the China coast.[4] Upon arriving China, Jan Con served as a broker between China and the Dutch factory at Formosa before he eventually returned to Bataiva in the early 1630s.[5] The place where he stayed in China was in southern Fujian, which was then the leading sugar production and trading centre of China,[6] and which was also the native place where most of the coolies working under Jan Con came from.[7] In other words, Jan Con and his labourers were from a place where sugar cane cultivation and sugar making were widely practiced by local peasants, and hence among them, the expertise of making sugar was of no lack.

With these advantages, Jan Con commenced adventure as the first sugar planter of Batavia in 1636. It was reported by the Governor General Antonio van Diemen on December 28, 1636 that Jan Con "has also set hand to the sugar plantation, having already placed 80,000 plants of sugar cane in the earth."[8] Van Diemen expected that "in one to two years [he] will deliver 2,000 piculs of white sugar to the Company at 5.5 rials".[9] On November 7, 1637, a special resolution was passed in the Council of the Indies in Batavia that Jan Con was exempted from the tithe of sugar he produced in or around Batavia for ten years, provided that he would only deliver all of his sugar to the Company against the market price in Banten.[10] On December 9, 1637, Van Diemen reported to the Gentlemen Seventeen that the

[1] Idem, 53-55.
[2] Idem, 52-64.
[3] Idem, 53.
[4]Idem, 55-60.
[5] Ibid.
[6] Daniels, *Agro-Industries and Sugarcane Technology*, 93-124; XU Guanmian, "Sweetness and Chaozhou: Construction of Tropical Commodity Chains on the Early Modern China Coast, 1560s-1860s" (M.Phil. Thesis, The Chinese University of Hong Kong, 2017), 13-30.
[7] Blussé, *Strange Company*, 104-105.
[8] W. P. Coolhaas, ed., *Generale missiven van gouverneurs-generaal en raden aan heren XVII der Vereenigde Oostindische Compagnie*, vol. 1 ('s-Gravenhage: Martinus Nijhoff, 1960), 570.
[9] Ibid.
[10] NA, VOC 1122: 455a, Kopie-resoluties, 7 Nov. 1637.

sugar cane planted by Jan Con grew up every day, and Jan Con had set up sugar mills and prepared moulds.[1] He thought "within few years as much sugar as in Banten will be gained."[2]

However, Van Diemen had apparently underestimated the risk inherent to sugar cane cultivation. Jan Con's plantations suffered from drought and theft from 1637-1639. Instead of 2,000 piculs of sugar, only 22.5 piculs of white powder sugar was delivered by Jan Con to the Company in 1638.[3] Worse still, the harvest of 1639 was largely destroyed by an extraordinary drought and partly by some ill-intended men who stole sugar cane.[4] Jan Con, himself, also suddenly died in that year,[5] and hence he missed a chance to witness the success of Chinese sugar plantations which he firstly introduced. Actually only three years after his untimely death, the fledgling sugar plantations in Batavia had grown up to a sustainable level so that the VOC decided to reduce the purchase price of Batavia sugar, which had, in previous years, been raised much higher than that of Banten in order to promote sugar plantations in Batavia.[6]

2.1.2 Ben Con in Formosa

Whereas Jan Con was at most a well-connected merchant, Ben Con had been both a successful merchant and an influential statesman by 1636. He was appointed as the head of Chinese community in Batavia in 1619, and had been officially referred to as the Chinese Captain (Capiteijn van de Chineesen) in 1628.[7] By 1636, he had been on that position for seventeen years and had amassed enough fortune to retreat to his hometown to enjoy a peaceful retired life. Therefore, when his friend Jan Con decided to open a sugar frontier around Batavia, Ben Con chose to resign his position and determine to leave.[8]

However, Ben Con's wish to return home could never be realized and he was instead involved in another burgeoning sugar frontier *en route*. Together with the succeeding governor of Formosa, Ben Con embarked a Dutch ship heading to that Dutch Formosa in 1636.[9] Originally, he wanted to take it as stepping-stone in order to eventually return to his hometown, which is just opposite across the Taiwan Strait. Yet once stopped over in Formosa,

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[1] J. K. J. de Jonge, *De opkomst van het Nederlandsch gezag in Oost-Indie*, vol. 5 ('s Gravenhage: Martinus Nijhoff, 1875), 233-234.
[2] Ibid.
[3] N. P. van den Berg, *Uit de dagen der Compangie: Geschiedkundige schetsen* (Haarlem: H. D. Tjeenk Willink & Zoon, 1904), 311.
[4] NA, VOC 662, Kopie-resoluties, 18 Jun. 1639.
[5] Blussé, *Strange Company*, 68-69.
[6] NA, VOC 665: 26, Kopie-resoluties, 7 Feb. 1642.
[7] Hoetink, "So Bing Kong," 354-355.
[8] Idem, 368-370.
[9] Idem, 370-371.

he found it was not wise to cross that strait, since Chinese mandarins had been waiting there to extort this rich overseas Chinese merchant who had served the red-haired barbarians for so many years.[1]

The fear of the mistreatment by the mandarins in China was one issue, and another reason to attract Ben Con to stay in Formosa was the promising sugar and rice agriculture which had been attracting many poor Chinese across the strait. On 26 November, 1636, just few months after Ben Con's arrival at Formosa, it was reported that the leaving Governor, Putmans, and the succeeding Governor, Burch, had jointly decided to promote the cultivation of rice, sugar and other crops on Formosa, in order to make that island as a rice granary (*rijs schuur*) to supply the Company's settlement in the East.[2] In the same report, it was also mentioned that more than 20,000 piculs sugar had already been purchased from China in that year, and in the same year, the Chinese in Formosa had only produced and delivered 12,042 catties (about 100 piculs) white sugar and 110,461 catties (about 920 piculs) brown sugar to the Company.[3]Hence, there was a huge gap between the demand of the Company and the production of Chinese sugar in Formosa. For these purposes, as well as for the sake of the insecurity in China, Ben Con had changed his mind and settled down in Formosa in order to help the poor Chinese to "join the cultivation of sugar and rice in Formosa".[4]

The situation of agricultural expansion in Dutch Formosa was different from that in Batavia, and it began with more favourable conditions. Being a settlement far away from the traditional trading network in the Indonesian archipelago, Formosa was heavily reliant on the supplies from China. That reliance, at times, became an acute threat to the VOC because there was no lasting peace with China until the early 1630s and even thereafter the supplies of commodities and necessities from China still hinged on the cooperation from the de facto ruler of the China Seas, the Zheng Clan.[5] It was hence a natural response of the VOC to promote agriculture in Formosa. Such a plan had been schemed as early as 1625 to attract Chinese immigrants to establish an agricultural colony.[6] For that purpose, a specific agricultural colony was designed at Saccam, which was on the fertile hinterland of the Fort Zeelandia.[7] There, the VOC had more advantages than in the Ommelanden of Batavia to

[1] Idem, 371.
[2] H. T. Colenbrander, *Dagh-register gehouden int Casteel Batavia,* 1636 ('s-Gravenhage: Martinus Nijhoff, 1899), 286.
[3] Ibid.
[4] Ibid.
[5]Cheng Wei-chung, *War, Trade and Piracy in the China Seas (1622-1683)* (Leiden: Brill, 2013)
[6] Andrade, *How Taiwan Became Chinese,* 119.
[7] Ibid; Chiu Hsin-hui, *The Colonial 'Civilizing Process'*, 150-153.

encourage agriculture because of the easy access to Chinese labourers and the less threat from indigenous people. Unlike Batavia, Formosa was situated just next to the China coast so that Chinese agricultural immigrants could easily cross the Strait by fish boats, instead of taking a long and expensive journey deep into the archipelagic Southeast Asia in order to reach Batavia. Also unlike Batavia, the Dutch settlement in Formosa was not adjacent to powerful states like Mataram and Banten. It was much easier for the Company to quell the sporadic resistance of indigenous Taiwanese people and to establish *Pax-Hollandica* in Formosa.[1]

By the time when Ben Con arrived Formosa, most of these favourable conditions had already been achieved, and sugar, as well as other crops, such as rice, wheat, ginger, tobacco, and indigo had been grown by Chinese immigrants there.[2] Among these commodities, sugar was somehow exceptional, since it was the only staple commodity for long-distance trade rather than for local consumption and the victuals for the ships. In the early stage it was not specifically promoted, but in 1632 a policy was made to help the Chinese to plant sugar cane in Saccam by providing small sums of money and cattle.[3] The first harvest came in 1634 and the sugar made thereof was judged as competitive as that from China.[4] In 1635, sugar cultivation was expanding and Chinese planters planned to import 300 new Chinese labourers.[5] Nonetheless, throughout the 1630s, the production of sugar in Formosa remained at a low level which was overshadowed by the enormous import by the VOC from the China coast.[6]

Like Jan Con in Batavia, Ben Con's agricultural adventure in Formosa was not successful as well. In the beginning, the Company favoured Ben Con as much as other Chinese leaders who already had long-established business in Formosa. On February 10, 1637, it was reported that Ben Con was granted several pieces of land which was about 20 morgens, along with three other prominent Chinese merchants (Hambuan, Cambing, and Jaumo) in Saccam.[7] That land was supposed to cultivate rice and the Company would purchase the harvested rice against a fixed price (50 rials per last).[8] However, later in the same year, the Governor of Formosa, has suggested Ben Con was not as entrepreneurial as Hambuan and by

[1] Chiu Hsin-hui, *The Colonial 'Civilizing Process',* 46-48; Andrade, *How Taiwan Became Chinese*, 63-79.
[2] Andrade, *How Taiwan Became Chinese*, 119-126.
[3] Ibid.
[4] Ibid.
[5] Ibid.
[6] Lin Wei-sheng, "Heju Shiqi de Taiwan Shatang Maoyi," [The sugar trade of Taiwan during Dutch period], 15.
[7] Colenbrander, *Dagh-Register gehouden int Casteel Batavia,* 1637, 38.
[8] Ibid.

the end of 1638, he even clearly pointed out that "he has shown to be a better statesman than a merchant".[1]Also around that time, Ben Con expressed his wish to return to Batavia, where he arrived on March 14, 1639.[2]

Neither Jan Con nor Ben Con had a happy ending in the agricultural adventure by their elder life, but they witnessed and also contributed to the critical extension of the Company from a trading empire to an agricultural territorial state in the 1630s. In fact, they were not professional agriculturalists but agents who were versed of commercial and urban issues instead of sugar cultivation. They were attracted into agriculture largely because of the stimulus policies and the surging demand of sugar by the Company, which were further driven by the remote changes in the Atlantic world. Their unsuccessful attempts notwithstanding, sugar as a cash crop had been introduced and rooted both in the Ommelanden of Batavia and Saccam in Formosa by the end of the 1630s, and since then these two sugar frontiers would take divergent paths.

2.2 The divergence between the Ommelanden and Saccam, 1640-1661

The nascent sugar agro-industry in Formosa and Batavia was stimulated and protected by the Company in the 1630s, but in the long term, that kind of stimulation was not sustainable and new balance had to be introduced. Into the 1640s and 1650s, sugar price began to fluctuate and would eventually fall to a crisis-level by the end of the 1650s. In a volatile global sugar market, the Ommelanden of Batavia and Saccam of Formosa experienced divergent development in these two decades. Whereas the sugar agro-industry in Batavia developed in a plantation way which hinged on the subsidy by the VOC, sugar in Formosa thrived as an integrated part of a burgeoning Chinese settlement colony, which would eventually be incorporated into a Chinese state.

2.2.1 Ommelanden: Towards a plantation society

On 7 February, 1642, the Council of the Indies in Batavia passed a new resolution, which marked a new stage of the sugar cultivation in the Ommelanden. In that resolution, it was decided that the purchase price of white sugar should be reduced from 9 rials per picul to 5.5 rials, because sugar planters in the Ommelanden had passed the vulnerable initial stage and become sustainable. It explained that old price of 9 rials was previously proclaimed to attract

[1] Hoetink, "So Bing Kong," 375, 396.
[2] Idem, 376-377.

more Chinese inhabitants to plant sugarcane in the Ommelanden. That price was however twice as much as that in Formosa, Banten, and Jepara. Against such a favourable price, the sugar plantation in the Ommelanden had been quickly expanding. Therefore, the Company judged it was time to reduce the price to a reasonable level at 5.5 rials per picul, which was fairly enough to cover the cost of Chinese planters and to maintain the prosperity of sugar agro-industry in the Ommelanden.[1]

That decision was not without good reason. For a certain period, 5.5 rials per picul was an acceptable price for all parties. At first, the seemingly sudden cut of sugar price in 1642 was in fact a reasonable return to the earliest price offered by the VOC to Jan Con in 1636.[2] It is likely that, after the unsuccessful attempts by Jan Con, the Company had dramatically raised the price of sugar in order to attract more adventurers. That policy had achieved its purpose in 1642 and hence had become no longer necessary. The adjusted price in 1642 was maintained for several years. In 1647, sugar price was increased from 5.5 rials per picul to 6.5 rials upon the demand of the Chinese planters,[3] but that price had fallen back to 5.5 rials in the following years, since in 1654, a new decision was made again to raise sugar price from 5.5 rials to 8.5 rials for the best sort and 6 rials for the second.[4]

Also in that period, the global sugar market was favourable to Chinese planters in the Ommelanden. It was thanks to the renewed troubles in Dutch Brazil on the one hand, and the fall of the Ming Empire in China on the other. The resurgence of wars in Brazil after the departure of the Prince of Nassau, Johan Maurits, in 1644 disturbed sugar supply in the Atlantic world once again.[5] In 1645, being informed of the Portuguese rebel against the WIC in Brazil, the Gentlemen Seventeen doubled the order of sugar from Asia.[6] In that year, 2,583,017 pounds (ca. 20,664 piculs) of sugar was shipped by the VOC to Amsterdam. Two years later, in 1647, the shipment from Asia had steadily climbed to 3,492,737 pounds (ca. 27,942 piculs).[7] Also in 1644, the Ming Empire collapsed. The ensuing wars between the Manchu and Ming loyalists contributed to the destruction of sugar production on the China coast.[8] As a result, the purchasing price of white sugar in Formosa and the China Coast soared

[1] NA, VOC 665: 26, Kopie-resoluties, 7 Feb. 1642.
[2] Coolhaas, *Generale missiven*, vol. 1, 570.
[3] Coolhaas, *Generale missiven*, vol. 2, 329.
[4] NA, VOC 676: 30, Kopie-resoluties, 18 Mar. 1653.
[5] Reesse, *De suikerhandel van Amsterdam*, 164-167; 200-202.
[6] Idem, 164.
[7] Idem, Bijlage F, CXIII.
[8] Lin Wei-sheng, "Heju Shiqi de Taiwan Shatang Maoyi," [The sugar trade of Taiwan during Dutch period], 22-23.

in the period between 1645-1652 from 4 rials per picul to 14.25 rials.[1] Against that backdrop, in 1654, the Chinese planters in Batavia collectively appealed to increase the long-standing price of 5.5 rials per picul.[2] After days-long consideration, the Council of the Indies complied and raised the purchase price of sugar to 8.5 rials per picul for the best sort of sugar and 6 rials for the second best.[3]

During these favourable years, the sugar cultivation in the Ommelanden was steadily expanding. The Governor General, Van Diemen, reported on December 22, 1643 that the agriculture of the Ommelanden was flourishing; a Chinese merchant, Bingam, had planted many fields with sugar cane. Against these observations, he expected a lot of white sugar would be delivered to the Company at 5.5 rials per picul.[4] The production of sugar was indeed increasing. The Chinese were able to deliver 589,221 pounds (ca. 4,713 piculs) in 1649, about 10,000 piculs in 1651 and about 12,000 piculs in 1652.[5] Learned of the steady growth, the directors of the VOC replied in October, 1651, "it pleases us well that the plantation of sugar outside Batavia developed well and keeps growth, which, because of the continuous troubles in Brazil, brought great profit to us."[6] They even encouraged the Company in Batavia to "raise the price of sugar somewhat so that [the planters] would sustain and not be diverted therefrom."[7]

Also in these prosperous years, a major feature of the landownership in the Ommelanden appeared. The earliest existing list of landowners in the Ommelanden was made ca. 1650. It shows the names of 166 registered landowners in the Ommelanden who jointly possessed about 5544 morgens (ca. 4712 hectares).[8] According to Hendrik E. Niemeijer's study, these lands extended roughly east-west from Bekasi River to Tangerang River, and north-south from Batavia City to nowadays Pulogadung and Kebayoran. Most of these lands were actually simply given out by the Company and had yet to be cultivated. Among the landowners, the majority were 74 Europeans who accounted for 60.37% of the total land. Following them were 24 Chinese landowners who accounted for 25.11%, 26 Southeast Asian and Muslim landowners for 7.96%, and 42 Mardijkers for 6.54%. It is not sure whether a systematic

[1] Ibid.
[2] NA, VOC 677, Kopie-resoluties, 15 Dec. 1654.
[3] Ibid.
[4] Van den Berg, *Uit de dagen der compangie*, 312.
[5] Idem, 313-314.
[6] Idem, 314.
[7] Ibid.
[8] B. Brommer, *Historische Plattegronden van Nederland*, *deel 4, Batavia* (Lisse: Stichiting Historische Stadsplattegronden, 1992), 79-80.

cadastral survey had been made, since the list is based on the relative position of each piece of land to its adjacent land and is not accomplished with a survey map.[1]

Name and locations	Size(morgens)
The eastern side of the city Batavia, between the great river(Ciliwung) and the seaside	
Gocko Chinees	1.61
Lakko (the Chinese Captain)	5.40
d' Chinees kerckhoff	3.44
Conjock Chinees	2.04
Conjock Chinees	9.86
Bingam (the Chinese Captain)	18.90
Chougoe Chinees	52.80
Subtotal	94.06
The southern side of the city Batavia, between the great river(Ciliwung) and the small river(Grocot)	
Piquo Chinees	2.72
Tenwon Chinees	36.54
Bingam (the Chinese Captain)	40.93
Jan San Chinees	9.02
Goecko Chinees	25.44
Jan San Chinees	113.71
Gicqua Chinees	6.67
Saqua Chinees	55.72
Bingam (the Chinese Captain)	6.31
Motte Chinees	102.24
Lijnko Chinees	77.67
Jan Sams Chinees	67.99
Joucqua Chinees	10.56
Subtotal	555.52
The western side of the city Batavia between the small river(Grocot) and the great river(Ankee)	
Jan de Chinees	10
Conjot Chinees	179.93
Oppecko Chinees	7.99
Conjock Chinees	533.64
Subtotal	731,55
Total	**1381.13**

1

Table 1. Chinese landowners in the Ommelanden ca. 1650.[1]

The lands held by those 24 Chinese landowners were scattered among the lands of Europeans, Mardijkers, and indigenous people. There were nine Chinese owners who individually possessed lands above 50 morgens: Conjock (545.54 morgens), Conjot (179.93), Jan San (122.73), Motto (102.24), Lijnko (77.67), Jan Sams (67.99), Bingam (66.14), Saqua (55.72), and Chougoe (52.80). Together, they accounted for 92% of the total land owned by the Chinese. Besides that, there were only 15 smaller Chinese landowners, including the already deceased Chinese Captain, Lacco. Their lands could be as little as 1.61 morgen apiece. The locations of all these Chinese lands were not concentrated in one specific area, but were isolated in distant districts of the Ommelanden. The largest Chinese landowner, Conjock, even had separate pieces of land in all three major parts of the Ommelanden. Overall, the lands controlled by these landowners show the number of Chinese landowners was limited and their land was not concentrated in certain areas.

We have yet to be able to track down the background of all these Chinese landowners, but there is some interesting information for two out of them. Bingam, holding 66.14 morgens, was the Chinese Captain during 1645-1663, who, as mentioned by Van Dieman, "had planted many fields with sugar cane" in 1643, and would be bankrupt in 1662 because his heavy investment in sugar plantations was struck hard by a crisis.[2] Conjock was a prominent Chinese merchant and was in fact a competitor of Bingam in succeeding the deceased Chinese Captain Lacco in 1645.[3]

These 24 Chinese landowners were not necessary the sugar planters responsible for the 10,000 piculs of Chinese sugar produced in the Ommelanden around 1650, and there were other participants who were absent in the land registration. The real situation was that sugar entrepreneurs often rented pieces of land from registered owners in order to set up their own plantations. A general picture of these plantations can be found in some bankruptcy files in the archives of the College of Schepenen. Thanks to the crisis by the end of the 1650s which forced many Chinese sugar planters to take refuge and left behind their assets, the College of Schepenen inventoried some of their left over properties.[4] One inventory shows two failed

[1] B. Brommer, *Historische Plattegronden van Nederland*, *deel 4, Batavia* (Lisse: Stichiting Historische Stadsplattegronden, 1992), 79-80.
[2] Van den Berg, *Uit de dagen der Compangie*, 312. NA, VOC 678: 110-115, Kopie-resoluties, 16 May. 1662.
[3] Hoetink, "So Bing Kong," 408.
[4] Niemeijer, *Batavia*, 113-114.

Chinese sugar entrepreneur, Lacco and Gouko, left slaves, buffaloes, sugar and harvested sugar cane behind.[1] The land they used to plant sugar was rented from Conjock.[2]

According to a report dated 1660, there was about 22-23 Chinese sugar mills in the Ommelanden before the crisis since 1656.[3] Unfortunately, there was no existing list of the owners of these sugar mill owners, but based on the above analysis, they included big landowners such as Bingam and also landless entrepreneurs such as Lacco and Gouko.

The sugar entrepreneurs, who either worked on their own land or on the land leased from others, were in no way like small house-holder peasants, but were operating plantations of considerable size. This point can be demonstrated in another contemporary bankruptcy file. In that case, a Chinese sugar planter, Nioto, failed and left behind 1 male and 5 female slaves, 50 buffaloes, 2 sugar mills with accessories, 2 sugar furnaces, 2 horses and 23 barrels of sugar that Bingam claimed, 370 barrels of syrup, some empty barrels and a piece of land with 12,000 plants of sugar cane.[4]

The information left by the bankruptcy file could only manifest the remnant property of a closed sugar plantation. The detail of a running plantation in the Ommelanden can be made up from a report which was submitted by an extraordinary member of the Council of Indies, Willem Verstegen, in 1651. It shows that an investor of a sugar plantation in the Ommelanden could loan 4,000 rials at an interest rate of 1% per month. That money was first invested to purchase 20 buffalo (1,000 rials), and to install sugar mills (500 rials). Then, it could be invested on monthly basis, to lease a piece of land that could be planted with about 120,000 plants of sugar cane (30 rials per month), to hire 10 Chinese for sugar cane cultivation (100 rials per month), 7 Chinese for working in the mills (70 rials per month), 5 Chinese to cut sugar cane in the field (40 rials per month), and 15 slaves (30 rials per month), to pay monthly interest (40 rials per month) and et cetera. In total, the monthly cost was 420 rials, while the monthly income was 700 rials which was from the sales of 90 piculs of sugar (7 rials per piculs and 630 rials in sum) and a certain quantity of syrup (70 rials). Eventually, the gross profit was 380 rials monthly and 2,960 rials annually, which were based on the purchase price of sugar at 7 rials per picul and were without consideration of the discount of the fixed investment of 1500 rials for buffalos and mills at the beginning.[5]

1. Fixed investment

[1] Ibid.
[2] Ibid.
[3] NA, VOC 663, Kopie-resoluties, 9 Mar. 1660.
[4] Ibid.
[5] De Jonge, *De opkomst van het Nederlandsch gezag in Oost-Indie*, vol. 6, VI-XIII.

20 buffaloes	1000	
Sugar mills	500	
Total fixed investment	**1500**	
2. Running cost		
2.1 Labour cost		
Labour for sugar mills	840	7 Chinese
Labour for sugarcane field cultivation	1,200	10 Chinese
Labour for harvesting sugarcane	480	5 Chinese
Labour for unknown assignment	1,080	15 slaves
Labour to fetch firewood	360	Unknown number
Subtotal	**3,960**	**72.79%**
2.2 Other running expenditure		
Land for 120,000 plants of sugarcane	360	
Oil and candles	120	
Reparation	120	
Interest	480	1% per month for 4,000 rials raised initially
Toll, basket, prahus, and the labour of prahus	400	
Subtotal	**1,480**	**27.21%**
Annual running cost	**5,440**	

Table 2. Fixed investment and running cost of a sugar plantation in the Ommelanden(1651), currency unit: rials.[1]

The sugar agro-industry of such a plantation had already become fairly specialized, well integrated and comparable to the contemporary sugar plantations in Dutch Brazil. It should employ around 22 Chinese and 15 slaves to both take care of the cultivation of sugar cane and the manufacture of sugar. These two processes were not separate as that in Dutch Brazil but were incorporated into the same complex under the same investment. Besides that, the purchase of 20 buffalo was also a considerable investment which were not only used for driving sugar millers but also for taking other kinds of heavy task such as ploughing fields and carrying firewood. In comparison with the water or wind wheels of the sugar mills in the West Indies, they were a much more flexible and multifunctional source of tracking power.

Who were missed in this plantation society were the indigenous people, who in the later stage would largely replace Chinese labourers and eliminate slaves from these plantations. The reason for their absence by then was linked with the tension between the Company and indigenous powers in the hinterland of Batavia. In the 1640s and 1650s, the confrontation between the Company on the one side, and Banten and Mataram on the other,

[1] Ibid.

was still in a stalemate.[1] The Ommelanden and even the Batavia city itself were at times threatened by Javanese and Bantenese forces. Hence, the indigenous people were constantly suspected and often expelled by the Company.[2] That situation made that there was no ready supply of native labour for Chinese plantations in the Ommelanden. As a result, these plantations relied on expensive imported Chinese labour and, to a less extent, on slaves. The annual labour cost of a Chinese sugar plantation (3,960 rials) at that time accounted for 72.79% of the total annual running cost (1,480).[3] The Company was also aware of that point so that when the sugar crisis came in the late 1650s, the Company decided to relieve the burden of Chinese planters by exempting the poll tax of 10 Chinese labourers for each plantation.[4]

By building these integrated sugar complexes and importing these waged Chinese labourers and slaves, the Chinese sugar entrepreneurs were in fact creating a sugar plantation economy without attaching to a settled rural society. The success and the subsistence of that economy almost solely hinged on the price of sugar and the security offered by the Company from the Batavia city. When the price was as high as 7 rials per picul according to Verstegen's report and when the plantations were not molested by wars in the early 1650s, the profit was handsome, but when crises came in the late 1650s, the whole economy would be quickly subject to devastation.

At the first, that high price was not sustainable. The market had begun to turn down after 1654 when the fall of Dutch Brazil to the Portuguese terminated the wars in Brazil and gradually re-stabilized sugar trade in the Atlantic. As a result, the sugar from as far as Asia became no longer competitive in Amsterdam.[5] The purchase price of sugar in Formosa had also begun to fall since 1654, and had been set at maximum 5 rials in 1657.[6] In the Ommelanden, situation was getting steadily worse around 1657. In 1657, the Company in Batavia had received an instruction from Amsterdam which complained that the sugar from the Dutch East Indies could not be sold to cover the cost and hence had become useless.[7] On April 27, 1657, the Council of the Indies were obliged to order Dutch Formosa to allow the Chinese in Formosa to sell their sugar to China when the demand from Japan and Persia had

[1] Niemeijer, *Batavia*, 85-93.
[2] Ibid.
[3] Table 2. Fixed investment and running cost of a sugar plantation in the Ommelanden(1651).
[4] NA, VOC 663, Kopie-resoluties, 9 Mar. 1660.
[5] Reesse, *De suikerhandel van Amsterdam*, 167.
[6] Lin Wei-sheng, "Heju Shiqi de Taiwan Shatang Maoyi," [The sugar trade of Taiwan during Dutch period], 22-23.
[7] NA, VOC 677, Kopie-resoluties, 27 Apr. 1657; 27 Jul. 1657.

been secured, since sugar was no longer required by the fatherland.[1] On the July 27, 1657, the Council of the Indies made a difficult decision to disobey the order from Amsterdam which required them not to purchase white sugar in Batavia at higher than 4 rials per picul for the best and 3.25 rials for the second.[2] They insisted to purchase Batavia sugar at 6 rials per picul for the best, 5 for the middle, and 4 for the third sort, "in order to not destroy the planters of that crop, on top of their already suffered damage, [which was caused] by the war as well as by the loss from the fire of the sugar cane on 24 of the last month [which] covered the whole area of Anke."[3]

The outbreak of a war between the Company and Banten made the matters worse. On December 4, 1656, it was reported that the Bantenese were setting sugar fields afire near the Anke River in the Ommelanden, the flame of which could be seen from the Batavia city night after night.[4] That war would last into 1659 and devastated all sugar plantations outside the fortifications of Batavia.[5] By the 1660, the Council of the Indies remarked that the number of sugar plantations had been reduced from 22-23 in the pre-crisis period to 8-10.[6]

At the same time, the directors of the VOC were continuously pushing for a lower price. In 1660, the Council of the Indies were eventually obliged to further reduce the price of sugar to 5 rials for the first sort and 4 rials for the second.[7] By then, the purchase was still made, partly out of the consideration to maintain relation with Chinese planters, and also partly because "without sugar, there would be no other suitable ballast cargo for the bottom of the return fleet".[8] In that year, only 784,004 pounds (ca. 6,272 piculs) of sugar was shipped by the VOC from to Amsterdam, that is, 24.49% of the pre-crisis level in 1655 at 3,214,660 pounds (ca. 25,717 piculs).[9]

The protection from the Company notwithstanding, the Chinese sugar plantation society had been decimated in these troublesome years. In 1662, the Council of the Indies had a meeting with the Chinese planters headed by the Chinese Captain Bingam. In that meeting,

[1] NA, VOC 677, Kopie-resoluties, 27 Apr. 1657.
[2] NA, VOC 677, Kopie-resoluties, 27 Jul. 1657.
[3] Ibid.
[4] Van den Berg, *Uit de dagen der Compangie*, 313.
[5] NA, VOC 678: 110-115, Kopie-resoluties, 16 May. 1662.
[6] NA, VOC 663, Kopie-resoluties, 9 Mar. 1660.
[7] NA, VOC 678: 11, Kopie-resoluties, 3 Feb. 1660.
[8] Ibid.
[9] Reesse, *De suikerhandel van Amsterdam*, Bijlage F, CXIII.

these planters complained that they had been indebted of 10,000 rials because of these disasters and they were insolvent.[1]

2.2.2 Formosa: Towards a Chinese settlement colony

In comparison with the Ommelanden of Batavia, the Chinese society in Formosa was able to expand sugar cultivation more successfully in the prosperous period from 1645-1651, and thereafter also much more resilient against the crisis. The different performance of the Ommelanden and Dutch Formosa in a similar sugar market under the same Company was largely attributed to the different social structure in these sugar frontiers. Whereas the Chinese sugar in the Ommelanden was organized in a plantation way, in which sugar entrepreneurs organized integrated plantations and employed labourers and slaves in order to exclusively produce sugar for an monopolistic buyer, that is, the VOC; the sugar cultivation in Saccam of Formosa was deeply embedded into a Chinese settlement colony which were able to attract numerable Chinese from the nearby Chinese coast to settle down as farmers. These farmers were not only producing sugar for the Company but had much multiple choices.

Why did these two Chinese sugar frontiers under the same Dutch Company evolve into different rural societies? Admittedly, both the sugar agro-industry of Dutch Formosa and Batavia were original in China, but there were two decisive factors made these two colonies different: 1. Formosa was close to the China coast, whereas Batavia was far away; 2. The Company aimed to establish a Chinese settlement colony in the rural areas of Formosa, but no such plan had been seriously considered in the Ommelanden of Batavia. These factors can be reflected from the perspectives of market, population, and institutions in these two divergent sugar frontiers

In sugar market, China could either be a powerful competitor of Formosa sugar or a promising market, and a transition from the former to the latter was exactly what had happened in the decades of the 1640s and 1650s. Before 1646, the VOC in Formosa were continuously purchasing sugar from the China coast, but the import was steadily decreasing from the peak in the late 1630s. According to the records collected by Lin Wei-sheng, the VOC imported 29,036 piculs of sugar in 1637 and 22,945 piculs in 1638, and that figure had declined to 9,214 piculs in 1644 and 1,000 piculs in 1645.[2] After 1646, the sugar production area of China was devastated by recurrent civil wars and the price of sugar from China sky-

[1] NA, VOC 678: 110-115, Kopie-resoluties, 16 May. 1662.
[2] Lin Wei-sheng, “Heju Shiqi de Taiwan Shatang Maoyi,” [The sugar trade of Taiwan during Dutch period], 15-16.

rocketed from 4.5 rials per picul in 1647 to 12 rials in 1649.[1] At the same time, as Lin Wei-sheng has pointed out, Dutch Formosa began to first export syrup and then sugar to China.[2] The export of sugar had become especially remarkable from 1657 onwards. On April 27 of 1657, a resolution was issued by the Council of the Indies that the Chinese in Formosa were allowed to ship and sell sugar in China. In that year, 5,917.49 piculs of white sugar and 5,300 piculs of brown sugar was exported to China; and in the following year, 1658, about 8,000 piculs of sugar was exported to China.[3]

The change in 1657 was actually crucial for Formosa sugar, since, as having been discussed in the last section, also in that year the Company was forced to dramatically reduce the purchase price of sugar in the Ommelanden and the Chinese sugar plantations there began to collapse. Such a collapse did not happen in Formosa at least partly because it was able to find buyers other than the Company. In the long-term, the Chinese consumer market would become a decisive factor in supporting the spectacular growth of the Formosa sugar agro-industry after it was eventually incorporated into the Qing Empire in 1683.[4]

The proximity of Dutch Formosa to the China coast also contributed to another advantage of Formosa sugar, that is, labour. Unlike Batavia, the Chinese could simply take fish-boats to cross the narrow strait between Formosa and China. Since the mid-1640s, the inflow of Chinese immigrants had been further accelerated by the civil wars back in China. In 1648, there were already more than 20,000 adult male Chinese in Dutch Formosa, of whom many were residing in the agricultural area around Saccam.[5] Among these settlers, a large number of Chinese immigrants were simply looking for a peaceful place to settle down, rather than searching for jobs in plantations in order to earn some money for their families back in China. From the aspect of these refugee-turned settlers, subsistent crops like rice was at least equally important as sugar.

This was exactly reflected in some land surveys made by the Company, which showed more land was cultivated with rice than with sugar. In general, the acreage of sugar was consistently less than that of rice. Even in 1650, when sugar cultivation in Dutch Formosa reached a peak, sugarcane was still less cultivated than rice by Chinese farmers. Thereafter, the gap between sugar and rice became more significant. Close to the final years of Dutch rule in Formosa, the size of sugar fields was only about 28% of that of rice fields. Apparently, rice

[1] Idem, 23.
[2] Idem, 15-17.
[3] Ibid.
[4] Xu Guanmian, "Sweetness and Chaozhou," 31-38.
[5] Chiu Hsin-hui, *The Colonial 'Civilizing Process'*, 150.

was preferred by Chinese farmers in Formosa to sugar. The Company was also aware of that tendency so that they were obliged to keep sugar price high.[1]

	Sugar fields (morgens)	Rice fields (morgens)	Sugar/rice field ratio
1645[2]	612	1713	35.73%
1647[3]	1469.25	4056.5	36.22%
1650[4]	2928.2	3481.1	84.12%
1651[5]	1380	1924	71.72%
1652[6]	1314.9	4539.4	28.97%
1654[7]	1309.8	2923.2	44.81%
1655[8]	1516	5577.7	27.18%
1656[9]	1837.3	6516.4	28.20%
1657[10]	1668.1	6026.5	27.68%

Table 3. Acreage of sugar and rice in Dutch Formosa.

That settlement colony was also institutionally encouraged by the Company. Instead of managing Chinese immigrants through the Chinese Captain in the Batavia city, the Company in Formosa had designed a specific area around Saccam to attract Chinese agricultural immigrants. In 1647, when delimiting the geographic range of the Chinese agricultural colony, the VOC had specifically expressed the purpose to let the Chinese settle down in the granted land so that they and their offspring could stay there.[11] According to the original reports,

[1]Pol Heyns, *Ho-lan shih tai T'ai-wan te ching chi, t'u t'i yü shui wu* 荷蘭時代台灣的經濟．土地與稅務[*Economy, Land Rights and Taxation in Dutch Formosa*] (Taipei: Appleseed, 2002), 105-109.
[2] NA, VOC 1149: 861-862, "Copie missive van Caron ende sijnen raedt aen den president ende raden des gouvernements van India in dato 28 Oct. 1645," 28 Oct. 1645.
[3] NA, VOC 1164: 412, "Notice van de besaijde landen op ende omtrent Saccam," Sep. 1647.
[4] NA, VOC 1176: 792, "Specificatie van de vruchten der besaeijde landen op Saccam," 1650.
[5] Johannes Huber, "Chinese Settlers against the Dutch East India Company: The Rebellion Led by Kuo Huai-i on Taiwan in 1652," in *Development and Decline of Fukien Province in the 17th and 18th Centuries*, ed. E. B. Vermeer (Leiden: Brill, 1990), 277; VOC 1183: 868, "Verburg, Letter to G.G. and Councillors," 25 Oct. 1651.
[6] Huber, "Chinese Settlers against the Dutch East India Company," 279; VOC 1194: 110, "Verburg and Council, Letter to G.G. and Councillors," 30 Oct, 1952.
[7] NA, VOC 1207: 724, "Specificatie der beseijde landen aen Seccam in anno 1654," 1654.
[8]NA, VOC 1213: 553, "Specificatie der gesaijde en geplante vruchten," 1655.
[9] NA, VOC 1218: 458, "Specificatie der besaeijde en beplante landerijen in den jare 1656," 1656.
[10] NA, VOC 1222: 534, 1657.
[11] Idem, 96-97.

which contributed to the above table, most of cultivated land in Dutch Formosa was situated at Saccam.

Between that Chinese rural society at Saccam and the Company, there were a group of cabessas. In 1645, the documents of the Company began to refer to the institution of cabessas.[1] Without one Chinese *opperhoofd* or captain, the Chinese community in Dutch Formosa was led by a number of Chinese cabessas (hoofden).[2] These cabessas were mainly Chinese merchants residing in the commercial town of Tayouan near the Dutch Castle of Zeelandia.[3] They were elected by the local community of Chinese settlers and were the principal agents between the Company and the Chinese rural society.[4] In 1650, when the cultivation of sugar cane was quickly expanding and the farmers lacked money to hire seasonal labourers to harvest sugarcane, the Company lent 2000 piculs of pepper, at 15 rials per picul, to ten Chinese cabessas at Tayouan. These cabessas sold that pepper and got cash to support Chinese sugar farmers at Saccam and were obliged to repay that debt with sugar within seven months.[5] In justifying that transaction, the Governor of Dutch Formosa described these cabessas were "indeed the principal promotors of the sugar cultivation."[6]

Besides the cabessas from Tayouan, there were a number of big Chinese sugar farmers from Saccam also able to obtain loans from the Company for sugarcane cultivation. According to the recent research by Hui-Wen Koo, in 1651, the Company granted new credit to eight Chinese merchants and cabessas; and also at that year, there were eleven important Chinese farmers from Saccam requesting credit from the Company and they were lent with pepper as well.[7] Among these farmers, there was the famous leader of Chinese rebel, Faij-it (Guo Huaiyi), who raised a revolt against the Dutch in 1652, when sugarcane harvest failed and these farmers became heavily indebted to the Company.[8]

Under these cabessas and big farmers, there were small-scale growers of sugarcane who borrowed money from creditors at extreme high interest rate level. It was observed by Willem Verstegen in 1651 that poor sugar growers, who were 'with empty hands', took money from "masters"(*meesters*) at an interest rate of 10 to 12 percent per month; when there was no

[1] Andrade, *How Taiwan Became Chinese*, 162-163.
[2] Ibid.
[3] Huber, "Chinese Settlers against the Dutch East India Company," 265-296.
[4] Andrade, *How Taiwan Became Chinese*, 162-163.
[5] Huber, "Chinese Settlers against the Dutch East India Company," 277
[6] Ibid; VOC 1183: 557, "Verburg and Council, Letter to G.G. and Councillors," 20 Dec. 1651.
[7] Hui-wen Koo, "Weather, Harvests, and Taxes: A Chinese Revolt in Colonial Taiwan," *Journal of Interdisciplinary History* 46:1 (2015): 39-59.
[8] Ibid.

means to repay the debt, they would abandon their tilled land and returned to the place where they were from.[1] It is not sure who the so-call "masters" were. But since the Company only granted pepper instead of cash to Chinese cabessas and big farmers, and the interest rate of 10%-12% per month was too high in comparison with that of 1% monthly in Batavia, the "masters" were unlikely to be the Company. It is rather likely that there was a chain of credit relationship in Dutch Formosa, in which the Chinese cabessas and big farmers, who had good connection with the Company, obtained credit from the Company at a normal interest rate and then they subcontracted it to the small farmers with usury and forced those poor peasants to cultivate sugarcane and to deliver sugar to them.

Furthermore, it was reported that sugarcane farmers also hired seasonal labourers (*congsia*) to cut sugarcane during sugar-making months. When the harvest was enormous in 1650, wage for these seasonal labourers became too high to farmers. Via the Chinese cabessas, they required credit from the Company.[2] The existence of these seasonal labourers notwithstanding, there was no evidence indicating that these labourers had been integrated into a plantation system and worked years-long as the waged labourers in the Chinese plantations the Ommelanden of Batavia. It requires further research to investigate how sugar mills were organized in Dutch Formosa.

The credit system played a big role in the sugar agro-industry of Saccam. When market was favourable, that system could be conducive to quick expansion of production by granting small-scale farmers to engage in sugar-making. But, when crop failed and credit collapsed in 1652, it struck the Chinese rural society of Dutch Formosa hard. In that year, the indebted Chinese farmer Faij-it (Guo Huaiyi) led a large group of poor Chinese peasants who rebelled against the Company. They attempted to drive the Dutch out and made themselves the master of Formosa.[3] Without sufficient preparation and lack of support from Chinese merchants and cabessas at Tayouan, that rural rebellion was quickly suppressed.[4] Thereafter, the Company restricted the extent of the credit and liberated Chinese farmers from the harassing practice of checking poll-tax by the Company's soldiers.[5] Nonetheless, that credit system survived and still functioned into the late 1650s. For instance, on 8 October, 1655, when the Company observed the growth of sugarcane was flourishing, they granted 1,000 teals of Japanese boat-

[1]NA, VOC 1183: 853v-854r, "Verstegen and Council, Letter to G.G. and Councillors," 24 Oct. 1651.
[2] Huber, "Chinese Settlers against the Dutch East India Company," 277.
[3] Idem, 285.
[4] Idem, 265-296.
[5] Koo, "Weather, Harvests, and Taxes," 39-59.

silver(*schuitsilver*) to each principal farmers who had honoured their latest debt.[1] In 1658, the Company's resolution mentioned that kind of loans were made according to the annual practice.[2]

That abrupt rebellion notwithstanding, being part of an agricultural settlement colony, the Chinese sugar frontier in Formosa was much more successful in expanding production and also much more resilient when facing crises. Sugar production in Formosa quickly expanded in the favourable years in the 1640s. It reached a high point at about 35,000 piculs per year in 1651, whereas at the same year, the Ommelanden was only able to produce about 10,000 piculs.[3] Formosa sugar slid into a low point in the next year to about 8,000 piculs due to the uprising led by Guo Huaiyi.[4] Thereafter it began to grow again to about 27,300 piculs in 1657. Even in the following crisis-ridden years, the Chinese in Formosa could still produce about 9,900 piculs in 1658, about 17,000 piculs in 1659, and about 15,000 piculs in 1600.[5] In those years, sugar production in the Ommelanden, as mentioned in the last section, had virtually fallen into an obsolete status.

An ironical development was that the very success of the Chinese agricultural colony in Formosa would eventually lead to a fateful consequence to the Company. In 1659, an important Chinese cabessa, He Tingbin, changed his side to the Zheng Clan and persuaded Zheng Chenggong (Koxinga) to conquer Dutch Formosa.[6] In order to convince Zheng, He Tingbin brought with him a Dutch map which showed a prosperous agricultural frontier opened by the Chinese immigrants.[7] Being attracted by such a promising agricultural settlement, Zheng Chenggong launched his famous campaign in 1661 and eventually took that colony from the Company in 1662.[8]

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[1] J.L. Blussé, W.E. Milde and Ts'ao Yung-Ho, *De Dagregisters van het Kasteel Zeelandia, Taiwan, 1629-1662, Deel III: 1648-1655* (Den Haag: Instituut voor Nederlandse Geschiedenis, 1996), 590.
[2] Hui-Wen Koo, "A Revolt in Colonial Taiwan," 49; VOC 1228: 523, Overgekomen brieven, 14 Jan. 1658.
[3] Lin Wei-sheng, "Heju Shiqi de Taiwan Shatang Maoyi," [The sugar trade of Taiwan during Dutch period], 14; Van den Berg, *Uit de Dagen der Compangie*, 314.
[4] Lin Wei-sheng, "Heju Shiqi de Taiwan Shatang Maoyi," [The sugar trade of Taiwan during Dutch period], 14.
[5] Ibid.
[6] Andrade, *How Taiwan Became Chinese*, 234.
[7] Ibid.
[8] Ibid.

3. The expansion of the frontiers: Transforming the Ommelanden (1662-1734)

After Dutch Formosa became Chinese Taiwan, the only remaining Sino-Dutch sugar frontier in Asia was the Ommelanden of Batavia. On that frontier, the decades between 1662 and 1734 were a period of expansion. From a humble beginning, the Company extended rural territorial control to the whole Ommelanden; the Chinese plantations stretched across and beyond the Ommelanden; and the landscape of the Ommelanden was transformed beyond recognition. In that process, the nascent sugar plantation society in the Ommelanden grew to its maturity, and a unique social class, the Chinese sugar-millers, became the most articulated group who represented the interests of these rural plantations. At the same time, company personnel and the elite of the Chinese, European, Mardijker, and indigenous people, who were often residing inside the city walls became the principal landowners of the Ommelanden through a localized Dutch rural institution, the College of Heemraden. The expansion process and the nature of that plantation society will be examined in this chapter.

3.1 A humble beginning, 1662-1682

Such a transformation had a crisis-ridden beginning. The 1660s and 1670s were a nadir in the sugar history of the early modern Dutch East Indies. In 1662, the promising sugar frontiers of Dutch Formosa was lost to the Chinese, and the Ommelanden of Batavia was pillaged by Bantenese troops. Although a peace agreement was concluded in 1659, the threat and harassment from Banten were persistent, and a new wave of attack would break out again in the late 1670s. During these two decades, the remnant of the once flourishing sugar frontiers of the Dutch East Indies was the sugar fields and mills within and adjacent to the defence line outside the city of Batavia.

That precarious situation can been manifested with a land map made around 1670.[1] It shows there was a rim of defence system in the suburb of Batavia, which consisted of a series of redoubts such as that of Anke, Rijswijck, Noordwijck, Iacatra, and Ansjol. These redoubts stood on strategic positions along rivers and were connected with each other by a road network. Within that defence system, there were measured and divided sugar and rice fields. Outside that system, sugar and rice fields were usually without clear boundary, and were

[1] Joannes Nieuhof, *Zee en Lant-Reize door verscheide Gewesten van Oostindien* (Amsterdam: de Weduwe van Jacob van Meurs, 1682), 197.The exact birth date of that map is unknown, but it should be made after Pieter van Hoorn's arrival at Batavia, 1663, and before Johannes Nieuhof's departure from Batavia, 1672, since the former's family name is on the map and the latter was the author of the book which includes that map.

adjoined by timberland (*saagland*), new plantations (*nieuwe plantage*), and endless wilderness.

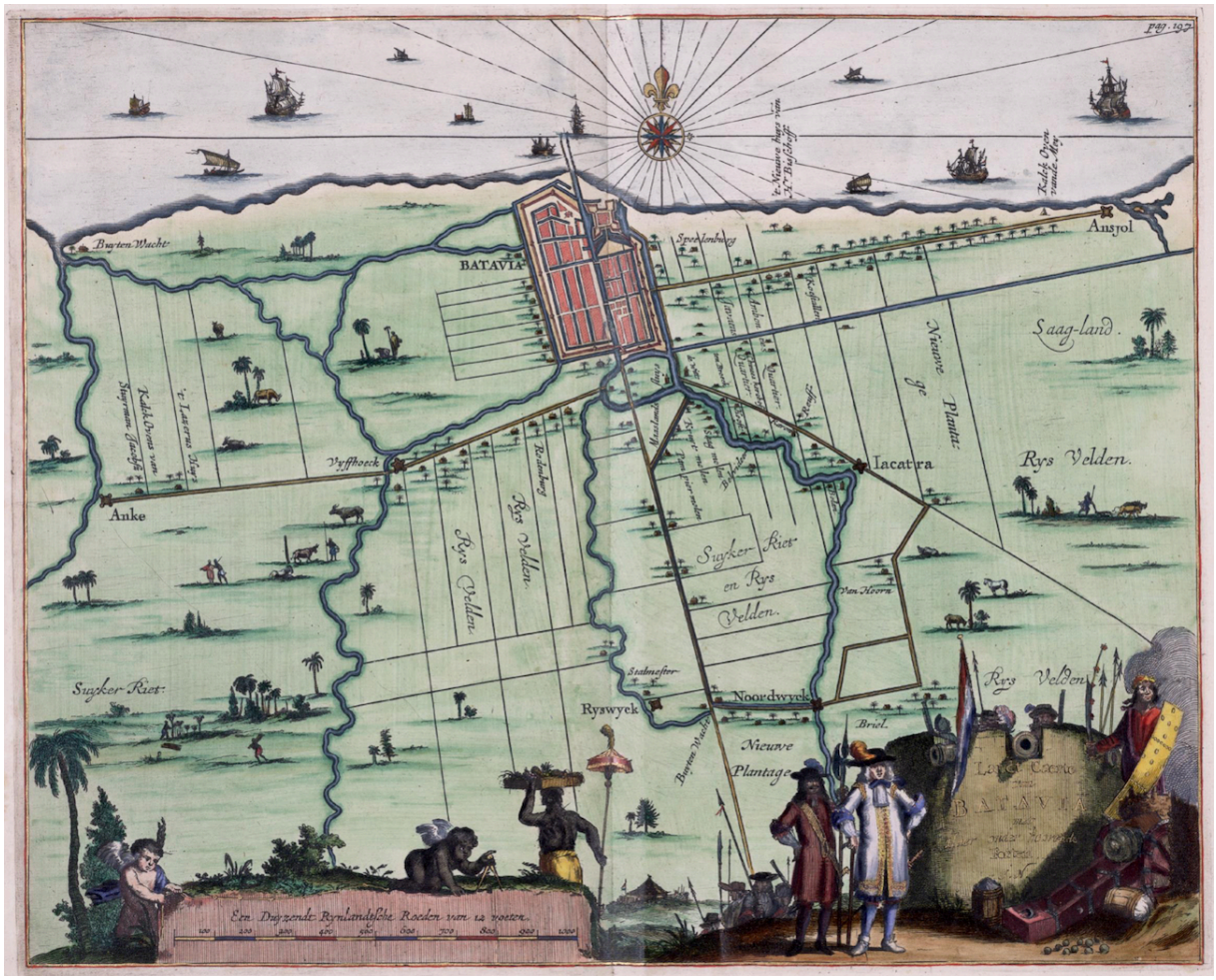

Illustration 5. Land map of Batavia with its forts (Landt caerte van Batavia met haer onder hoorend forten).[1]

The insecure situation in the Ommelanden contributed to tension between the Company and the Chinese planters. Whereas the Company aimed to restrict sugar production within the areas under its protection, the Chinese planters were attempting to augment production by expanding sugar frontiers beyond the fortification or by importing inferior sugar from elsewhere. In a resolution dated May 16, 1662, such a dilemma was obvious. In that case, the Chinese Captain Bingam and other Chinese sugar planters complained that they were on the verge of bankruptcy and would have to abandon sugar plantations, unless the Company could agree to raise the purchase price of sugar.[2] They were then heavily indebted and had ran out of money because, after the Bantenese wars, they invested a lot of money to rebuild sugar mills in the areas outside the fortification of the Company.[3] However, the Company was

[1] Ibid.
[2] NA, VOC 678: 110-115, Kopie-resoluties, 16 May. 1662.
[3] Ibid.

reluctant to bail them out because of two considerations: First, the Company thought such an expansion should not be encouraged, because the rebuilt sugar mills would become an easy prey in the future conflicts with the Bantenese; Second, when making delivery to the Company, the Chinese often adulterated Batavia sugar with sugar from Jepara or other places, which was of far worse quality than that of Batavia.[1]

In order to get rid of these inextricable problems entailed in Chinese sugar, in the same resolution, the Company decided to take a one-off solution by concentrating production into the hand of a singular manufacturer, that is, the owner of a water-driven sugar mill, Abraham Pittavin. Pittavin had previously served the VOC as a merchant and a captain of a fort in Ambon from 1643-1649.[2] He was found cheating the Company with false weigh of cloves in 1648, and was therefore dismissed and turned out to be a private citizen (*burger*) in 1649.[3] In 1662, with a license from the Company, he had constructed a water-driven sugar mill along a canal called Molenvliet.[4] That canal was within the Company's fortification and had been the locus of an 'industrialization program' between 1657-1664, when six water-driven mills were built along that canal in a rapid succession.[5] Besides Pittavin's sugar mill, the other watermills were built by the Company for sawing, for tanning and for producing gunpowder, flour, and paper.[6] Hence, the water-driven sugar mill of Pittavin was part of the industrialization and was not the only watermill supported by the Company. But that mill was the only watermill for sugar manufacture and it aimed to monopolize sugar production in the Ommelanden.

To protect the interest of Pittavin's watermill, the Company issued a specific edict on the sugar plantation and the delivery of sugar to the Company at Batavia (*Ordre op de suijker plantagie ende het leveren van suickeren aen de Compagnie alhier*).[7] On one hand, it gave Pittavin's watermill privileges against the buffalo-driven mills operated by the Chinese planters. It regulated that, unless the planters had their own sugar mills, all other sugar cane harvested in the Ommelanden should be delivered to Pittavin's watermill, and the sugar produced by Pittavin's watermill would be purchased at a higher price (5.75 rials per picul for the best and 4.25 rials for the second) than the sugar produced by the planters' own sugar

[1] Ibid.
[2] François Valentyn, *Oud en Nieuw Oost-Indiën* II, "Ambonsche Zaaken," "Zevende Hoofdstuk. Lyst der Bedienden van aanzien in Amboina," (Dordrecht: Joannes van Braam, 1724), 5, 6, 7, 35, 36, 39 & 42.
[3] Idem, 6&7.
[4] NA, VOC 678: 110-115, Kopie-resoluties, 16 May. 1662.
[5] Peter Boomgaard, "Technologies of a Trading Empire: Dutch Introduction of Water- and Windmills in Early Modern Asia, 1650s-1800," *History and Technology* 24:1 (2008): 45.
[6] Ibid.
[7] NA, VOC 678: 110-115, Kopie-resoluties, 16 May. 1662.

mills (5 rials per picul for the best and 4 rials for the second grade).[1] On the other, it excluded the adulterated sugar which mixed Batavia sugar with inferior sugar from elsewhere. A sugar censor (*keurmeester*) was placed to inspect sugar production and delivery in the Ommelanden. In case he found any violation of these regulations, he was entitled to make confiscation.[2]

The Company had high expectations of Pittavin's watermill and gave it further privileged price in a resolution dated 9 January, 1663. In that resolution, the Council of the Indies expected there would be a prosperous market for Batavia sugar, because the loss of the Island Formosa had made the Company have not sufficient sugar for the profitable market in Persia, and besides that they also needed sugar each year as the ballast cargo for the return fleets to the Netherlands.[3] Hence, that council decided to raise the price of the sugar from Pittavin's watermill to 6.56 rials (6 rials and 27 stuivers) per picul for the best sort and 4.25 rials for the second.[4] That price was exclusively for Pittavin, since for the sugar from other sugar mills operated by the Chinese, the old price, that is 5 and 4 rials respectively, remained applicable.[5] The Council expected that, in that year, Pittavin's watermill would deliver half of the sugar and the other half would be delivered by other sugar mills.[6]

However Pittavin's business fell apart soon, and there was no mentioning of his name or his water-driven sugar mill after 1663. The exact reason of his failure had been never disclosed, but a critical problem, as we can observe, is that he depended on the cultivation and supply of sugar cane from other planters. This was not the practice of the Chinese plantation owners, since as discussed in the last chapter, the Chinese in the Ommelanden had their plantation and sugar mill closely integrated into one plantation complex. The Company might be able to force those who had no sugar mills to deliver sugar cane to Pittavin, but the problem is that all Chinese sugar planters in Batavia usually had their own mills.

No other Dutch private citizens followed the example set by Pittavin, and they instead preferred to undertake easier business such as landowning. In a letter to the Gentlemen Seventeen dated December 26, 1662, the Governor-General, Joan Maetsuijker, and the Council of the Indies complained that the Dutch private citizens had little interest on agriculture.[7] They instead invested money in purchasing houses, courts, gardens and estates inside and outside the Batavia City, whose price was incredibly low by then, and whose profit

[1] Ibid.
[2] Ibid.
[3] NA, VOC 678: 18, Kopie-resoluties, 9 Jan. 1663.
[4] Ibid.
[5] Ibid.
[6] Ibid.
[7] De Jonge, *De Opkomst van het Nederlandsch Gezag in Oost-Indie,* vol. 6, 97.

was still handsome.[1]As a result, these Europeans were not inclined to cultivate the land but to enjoy the income from landownership.[2]

Among these European landowners, the Van Hoorn family were outstanding. As the first generation of that influential family in the Dutch East Indies, Pieter van Hoorn was from the ruling class of Amsterdam, where his grandfather had been a member of the city council.[3] His wife, Sara Bessels, was also from a prominent family in Amsterdam and was the granddaughter of the second Governor-General (1614-1615) of the VOC, Gerrit Reijnst.[4] Before moving to Asia, he owned a gunpowder mill in Amsterdam.[5] Probably because of some financial difficulties, he decided to sell his powder mill and accepted a position as the Extraordinary Councillor (*extraordinair raad*) in the Council of the Indies *(Raad van Indiê)*.[6] On 14 April, 1663, he boarded a ship and set sail to Batavia together with his wife and their children.[7]

Pieter van Hoorn arrived at Batavia on 14 November, 1663. His first office was the that of tax collector (*ontvanger*). On 19 September, 1664, he was appointed as a founding member of the College of Heemraden. Heemraden was a typical Dutch rural institution that was developed in the polder areas of the Netherlands.[8] In 1664, that institution was transferred by the Company to the Ommelanden of Batavia and the original resolution is as follows:

"After many different deliberations, made inside or outside the council, on the subject of putting the landerijen [(estates) of the Ommelanden] under the jurisdiction of the city, [it is] judged to be necessary that a heemraad is placed for these landerijen according to the mode customarily in our fatherland, because the inhabitants cannot get along with each other, and the landdrost (sheriff) alone cannot make proper order everywhere in the plain of the city, the lands and gardens [of which] have expanded everywhere. [It] is eventually decided and understood to install a college of certain heemraden, and to which the gentlemen, Pieter Anthonis Overtwaeter, Joan Thijsz, and Pieter van Hoorn, as well as the landdrost abovementioned are chosen as heemraden, making a college of four persons."[9]

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[1] Ibid.
[2] Ibid.
[3] Bea Brommer, *To my dear Pieternelletje: Grandfather and granddaughter in VOC time, 1710-1720* (Leiden: Brill, 2015), 215.
[4] Idem, 235.
[5] Idem, 215-216.
[6] Ibid.
[7] Ibid.
[8] Roger J.P. Kain and Elizabeth Baigent, *The Cadastral Map in the Service of the State: A History of Property Mapping* (Chicago and London: The University of Chicago Press, 1992), 11-12.
[9]NA, VOC 679, Kopie-resoluties, 19 Sep. 1664.

Hence, the situation was that before 1664, the rural area of Batavia, that is, the Ommelanden, was administered by a sheriff (*landdrost*). That was also previously the practice in Dutch Formosa.[1] But the development in the Ommelanden of Batavia was that in 1664 the more sophisticated rural institution, the College of Heemraden, was established "according to the mode customarily in our fatherland". Its major purpose was to manage the land on the Ommelanden, and the time of its establishment was likely linked with the disputes followed by the wave of land investment by the European as referred to in the above mentioned report dated December 26, 1662.

The foundation of the College of Heemraden was however merely the first step of the institutionalizing process in the Ommelanden. As discussed in the beginning of this section, during most period of the 1660s and 1670s, the agricultural expansion in the Ommelanden was restricted in the areas under the protection of the VOC. In that circumstance, the function of the College of Ommelanden was equally limited. There is no clear indication of its function and it was rather dissolved in 1672 without leaving any document in the archive of Heemraden.[2]

Nonetheless, Pieter van Hoorn's influence was increasing over time. After having headed the embassy to China (1666-1668), he was appointed as the president of the College of Aldermen (College van Schepenen) in 1669,[3] and accordingly he was also directing the College of Heemraden, which was under the College of Alderman at that time.[4] Also around that period, he obtained a big plot of land to build his estate in the Ommelanden.[5] That estate was marked on the above-mentioned map by Nieuhof on the southern suburb of the Batavia city, and next to it there were large tracts of sugar cane and rice fields. That estate would be gradually developed into a prestigious *buitenplaats*, Goenoengsari, in the Ommelanden.[6]

Pieter van Hoorn's aspiration to promote agriculture in the Ommelanden of Batavia was further manifested in his petition in 1675. In that year, he submitted a strong plea to the General Governor and the Council of the Indies to reform the structure of the VOC by opening free trade and to building a strong colony in Batavia. In the beginning of that letter, it was pleaded: "The word colony or colonizer means real agriculture and agriculturists, such

[1] Andrade, *How Taiwan Became Chinese*, 200.
[2] "Inventory van het College van Heemraden te Batavia (1664) 1682-1807 (1809)" (Arsip Nasional Republik Indonesia, Jakarta, 2003), 9.
[3] Ibid.
[4] Nieuhof, *Zee en Lant-Reize door verscheide Gewesten van Oostindien*, 218-219.
[5] Brommer, *To my dear Pieternelletje*, 104.
[6] Ibid.

that the foundation of colonies is to transport and place people, in order to labour, to plant and to culture the land which is either already suitable or can be made suitable."[1]

Pieter van Hoorn's vision, however, could not get support from the directors of the VOC, and he was involved in a factional conflict concerning the private trade in Bengal and was dismissed in 1677 together with three other councillors in the Council of the Indies.[2] Thereafter, he retreated to his estate in the Ommelanden and passed away at Batavia in 1682.[3]

Whereas the situation was less favourable in the Ommelanden, some prominent Chinese merchants turned attention to the import of sugar from elsewhere. On April 10, 1665, the Council of the Indies agreed to paid the sugar imported by the Chinese Captain Siqua at a price 0.25 or 0.5 real higher than that of the sugar produced in the Ommelanden.[4] It was because, with the support of the Director General, Carel Bartisinck, Siqua had imported Jepara sugar and refined it into bread sugar which was a good fit for the Persia market and was also better than that from Batavia.[5] On January 22, 1669, another resolution mentioned that the Chinese merchant Simo, the widow of the Chinese Captain Siqua and her son Tenqua together successfully obtained the annual tax farming (*pacht*) of the sugar import to Batavia at 6,600 rijksdaalders (8,250 rials), with a condition that the Company were not allowed to import sugar from Banten or Java with their own ships.[6] Their bid was much higher than that of the previous year, that is, 1,491 rijksdaalders (1,863.75 rials).[7] In 1670, the rapid increase of the import of sugar by the Chinese from the coast of Java as well as the sugar production in the Ommelanden led the Company to stop purchasing Bengal sugar for the market in the Netherlands, to which the shipment had recovered from a low point at 151,023 ponds (ca. 1,313 piculs) in 1663 to 1,616,334 ponds (14,055 piculs) in 1670.[8] Hence, although the demand from the Netherlands was increasing, the remarkable growth of sugar import from the

[1] Pieter van Hoorn, "Praeparatoire Consideratien", in *De opkomst van het Nederlandsch gezag in Oost-Indie*, vol. 6, ed. J. K. J. de Jonge ('s Gravenhage: Martinus Nijhoff, 1872), 130.
[2] Arthur Weststeijn, "The VOC as a Company-State: Debating Seventeenth-Century Dutch Colonial Expansion," *Itinerario* 38:1(2014): 26-27; F. S. Gaastra, "Constantijn Rans ten de corruptie onder het personeel van de VOC te Bengalen, 1669-1673," in *Bestuurders en geleerden: Opstellen over onderwerpen uit de Nederlandse geschiedenis van de zestiende, zeventiende en achttiende eeuw, aangeboden aan Prof. Dr. J. J. Woltjer bij zijn afscheid als hoogleraar van de Rijksuniversiteit te Leiden* (Amsterdam: De Bataafsche Leeuw, 1985), 126-127.
[3] Brommer, *To my dear Pieternelletje*, 235.
[4] NA, VOC 680: 74, Kopie-resoluties, 10 Apr. 1665.
[5] Ibid.
[6] NA, VOC 683: 24-25, Kopie-resoluties, 22 Jan. 1669.
[7] Ibid.
[8] NA, VOC 685: 114-115, Kopie-resoluties, 8 Aug. 1670; Reesse, *De suikerhandel van Amsterdam*, Bijlage F, CXIII.

coast of Java as well as the local output in the Ommelanden had been able to meet that demand.

These positive developments notwithstanding, the situation was rapidly turning down since the mid 1670s. At first, the Mataram empire began to disintegrate and rebellion broke out in earnest in 1675.[1] Thereafter, warfare swept the Pasisir and the tax famers of sugar import regularly complained in 1678 and 1679 that the sugar trade there was gravely disrupted.[2] In 1678, the VOC was also became involved in the Mataram feuds and its troops marched into the interior of Java in order to destroy a stronghold of the rebels.[3] In connection with that, the deep-rooted hostilities between Banten and the VOC deteriorated into a war again in 1677, when the Sultan of Banten decided to side with the rebels in the civil war of Mataram and moved his troops into the Ommelanden.[4] In these years, not only the import of sugar from the coast of Java was disturbed, but the city of Batavia was also surrounded by Bantenese forces with the result that the sugar plantations in the Ommelanden could not be spared.[5]

3.2 Plantations on a booming frontier, 1680s-1700s

This gloomy picture gradually changed for the better from the 1680s onwards owing to a number of external factors. In general, there were three pre-conditions for creating a flourishing sugar frontier in early modern Asia: a peaceful environment, an abundant supply of labour, and a broad market. Before the 1680s, none of these could be secured by the Company for the Chinese planters in the Ommelanden: there were incessant conflicts with neighbouring powers, a lack of indigenous labourers, and disadvantageous competition in the Atlantic sugar market.

But starting from the 1680s, the whole situation remarkably improved. At the first, the Company's military interventions in Mataram and Banten in the late 1670s and early 1680s successfully secured several peace treaties with them and established a military deterrent in Java.[6] In connection with that, Javanese people flocked into the Ommelanden when further aggression by Mataram and Banten came to a halt.[7] Also in the early 1680s, the Qing Empire

[1] M. C. Ricklefs, *A History of Modern Indonesia since c. 1300* (Basingstoke etc.: Macmillan, 1991), 73-78.
[2] Ibid; Niemeijer, *Batavia*, 115.
[3] Ricklefs, *A History of Modern Indonesia*, 76.
[4] Idem, 78-79.
[5] Ibid.
[6] Ricklefs, *A History of Modern Indonesia*, 74-80.
[7] Niemeijer, *Batavia*, 115-116.

subjugated the Zheng Clan at Taiwan and lifted decades-long prohibitions of private overseas trade.[1] That change encouraged many Chinese from southern Fujian to move to Batavia as well as its Ommelanden.[2] From now on, Javanese and Chinese immigrants provided a steady supply of labour and expertise to set up new sugar plantations in the pacified Ommelanden. At the same time, the Company was also expanding its intra-Asian sugar trade. Its factories in Persia and Japan provided a profitable outlet of Batavian sugar in these Asian consumer markets.[3] Under these advantageous conditions, a wave of investment on sugar plantations occurred in the Ommelanden, in which two important interest groups emerged, the sugar millers and the landowners, whose interests respectively hinged on their control of sugar plantation society and landownership. This section aims to understand how sugar plantation society and landownership evolved during that booming period.

3.2.1 New Labour, Lower Cost

In 1710, the High Government at Batavia commissioned a survey of sugar agro-industry in the Ommelanden because by then sugar millers complained that the low price offered by the Company (3 rijksdaalders per picul) was threatening their survival. The report of this survey supported that argument, and justified the imperative of raising the sugar price by showing how important the sugar agro-industry had become to the Company: it had become the most important agricultural produce in the Ommelanden. In all, 130 sugar mills were counted, and these mills collectively produced some 13,100,000 pounds (104,800 piculs) of sugar every year.[4] That result offered a stark contrast with the last available report of 1660, which mentioned only 8-10 sugar mills in the Ommelanden.[5] The location of the newly installed sugar mills also indicated that they had spread to the areas far beyond the Company's defence line in the Ommelanden. Apparently, the sugar frontier in the Ommelanden was experiencing an unprecedented boom and had expanded deep into the hinterland. But what kind of society had formed in this expansive frontier economy of sugar?

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[1] Zhao Gang, *The Qing Opening to the Ocean: Chinese Maritime Policies, 1684-1757* (Honolulu: University of Hawaii Press, 2013), 79-98.
[2] Batavia, *Strange Company*, 85-87; 121-124;
[3] Glamann, *Dutch-Asiatic Trade*, 159-161.
[4] Christoffel van Swoll and Hendrick van Zwaardekroon, "Uittreksel uit een Rapport en uit de bijlagen over de suijkercultuur, in de ommeladen van Batavia", in *De opkomst van het Nederlandsch gezag in Oost-Indie*, vol. 8, ed. J. K. J. de Jonge ('s Gravenhage: Martinus Nijhoff, 1875), 157-165. .
[5] NA, VOC 663, Kopie-resoluties, 9 Mar. 1660.

The survey report did not give an account of the social structure of that plantation society, but included a detailed list of all the expenses needed for setting up and operating a sugar plantation in the Ommelanden in 1710.

1. Fixed investment		
A sugar mill, its accessories, and buffaloes	2,368.36	
To prepare a plot of unclaimed land and to plant it with 200,000 plants of sugarcane	1,500	
Total fixed investment	**3,868.36**	
2. Running cost		
2.1 Labour cost		
One Chinese clerk, one Chinese headman (mandadoor), and four Chinese who supervised the cultivation	260	
20 Javanese, who cultivated sugarcane	400	
One Chinese supervisor of mill stones	50	
Salary for buffalo keepers	60	
8 Javanese, who transport sugar and other necessities out/into the mill with the canoes	120	
Javanese millers, firemen, water carriers, polishers, and sugarcane reapers, who were employed for the four milling months	440	
Wage for two Chinese sugar firemen in the milling months	120	
One Chinese, who purges sugar in the pots (drainage cones) with mud	52	
Subtotal	**1,502**	**51.11%**
2.2 Other running expenditure		
Maintenance and replacement of four large steel sugar pans	20	
Replacement of buffaloes	100	
Supplement of sugar pots (drainage cones) and their foots (receiving jars)	30	
Lime and stone for the reparation of the mill and the wage for the mason	35	
6 last rice (ca. 12 tons) for the maintenance of the work force	210	
Yearly change of iron wares of the mill	30	
Candles for one year	50	
200 *roeden* of firewood at 2 rijxdaalder per *roe*	400	
Baskets, palm leaves, rattans, and straws for one year	48	
Lime for making sugar	16	
Land rent for one year	150	
Interest (9% per year) for the fixed investment	348	

Subtotal	**1,437**	**48.89%**
Total annual running cost	**2,939**	

Table 4. Fixed investment and running cost of a sugar plantation in the Ommelanden(1710), currency unit: rijksdaalder.[1]

In comparison with the cost of the Chinese plantation in 1651, the running cost of the Chinese plantations had been reduced substantially. The annual running cost of the plantation of 1651 was 5,440 rials, and its annual output of powder sugar was 1,080 piculs. This implies that the average cost for producing one picul of sugar was 5.04 rials. By 1710, the annual expenses had been reduced to 2,939 rijksdaalders but the annual output slightly lowered at 800 piculs. By dividing them, the average cost for one picul of sugar in 1710 had declined to 3.67 rijksdaalders. Considering that one rial was on a par with one rijksdaalder in the Dutch East Indies, the average cost for producing one picul of sugar had been reduced by 27%, or 1.36 rials/rijksdaalders over the past sixty years.

The decisive factor in the reduction of average cost was the dramatic drop of labour cost. In 1651, labour accounted for 72.79% of the annual cost and expenditure of a plantation, while in 1710, it had been reduced to 51.11%. It means in average cost of a picul of sugar at 5.04 rials in 1651, 3.67 rials were for labour, while in 1710 only 1.88 out of 3.67 rijksdaalders were paid to labourers. Overall, the average cost of labour per one picul of sugar had been cut by 1.78 rials/rijksdaalders, that is, almost by half. That reduction was even higher than the decrease of the average cost (1.36 rials/rijksdaalders), as the other expenditure, such as firewood, had increased over that period.

How could this be achieved? It was neither because the size of plantation had been enlarged, nor the efficiency of each labour unit had been increased. The main reason was that the wage to each labourer had been reduced. Whereas the annual output of the plantation of 1710 (800 piculs) was actually lower than that of 1651 (1080 piculs), the number of labour employed by the former was rather slightly larger. In the plantation of 1651, 37 labourers, including 22 Chinese and 15 slaves, were full-timely employed, and no seasonal labour was required. In 1710, 38 labourers, including 10 Chinese and 28 Javanese, were hired year-round, and extra-Javanese labour would be recruited during four sugar-milling months. It means the number of labour employed was not reduced, but instead had increased over time, particularly if the seasonal Javanese labourers, whose number was not recorded in the report, are included. The vital point is that the average wage of them had been reduced substantially. In 1651, the wage for a Chinese labourer who worked in the mill or the sugar cane fields was 10 rials per

[1] De Jonge, *De Opkomst van het Nederlandsch Gezag in Oost-Indie,* vol. 8, 157-164.

month, or 120 rials yearly. Workers cutting sugar canes earned 96 rials per year, and slaves only 72 rials per year. In 1710, the wages of one Chinese clerk, one Chinese headman, and four Chinese supervisor of sugar-cane cultivation collectively amounted to 260 rijksdaalders per year, that is, 43 rijksdaalders per each of them. The wages for other Chinese technicians, such as the millstone supervisor (60 rijksdaalders), the two firemen (60 rijksdaalders each), and the specialist purging sugar with clay water (52 rijksdaalders), were a little higher, but still much lower than the average level of 1651. Even less gained were the Javanese labourers who usually had no special expertise: twenty Javanese sugar-cane cultivators only received 400 rijksdaalders per year (20 rijksdaalders each), and eight canoe crewmembers earned merely 120 rijksdaalders per year (15 rijksdaalders each).

Such a dramatic decrease of wage level owed to an abundant supply of Javanese and Chinese labourers since the 1680s. As mentioned at the beginning of this section, the peaceful environment of the Ommelanden and the opening of private trade in China during this period attracted numerous Javanese and Chinese to the burgeoning sugar economy outside the Batavia city. Their inflow lowered the level of wage and also changed the ethnicity of the plantation society. Slaves almost completely disappeared and the relatively expensive Chinese labourers were also squeezed out from the less specialized jobs such sugar-cane cultivation and local transportation. They were only employed as technicians, clerks and supervisors. The majority of labour force now was made up by the Javanese, who took up all daily heavy works and were massively recruited as seasonal labour during the sugar milling months. At this point, it was even doubtful whether these plantations should be still defined as Chinese plantations, although the capital, management, and technology were still fully controlled by the Chinese.

The abundance of Javanese labour was further linked with the changing settlement pattern in the Ommelanden. Since circa 1660, the Company began to settle their Indonesian auxiliary troops, mainly Ambonese and Makassarese, in the Ommelanden of Batavia. They were granted plots of land to form their *kampungs* in order to sustain their family and were expected to defend the city during war time.[1] In the 1680s, the *kampung* system was further regulated. Each *kampung* was corresponding to a specific ethnic group and was led by a headman with military rank.[2] They were also registered under the new College of Heemraden, which, as will be discussed below, was re-organized in 1679. By 1710 sixteen *kampungs* were

[1] Remco Raben, "Round about Batavia: Ethnicity and Authority in the Ommelanden, 1650-1800," in *Jakarta-Batavia: Socio-cultural Essays*, ed. Kees Grijns and Peter J. M. Nas (Leiden: KITLV Press, 2000), 94-97.
[2] Ibid.

registered under the Heemraden, among which there were two Javanese *kampungs* led by Captain Soeta Wangsa.[1] The benefit for indigenous people like Javanese was that with those *kampungs,* they actually obtained settlement rights in the Ommelanden and could form their own villages. At the same time, a large number of Javanese were still unregistered and just roamed into the Ommelanden from the rest of Java in search for a job. Nevertheless, either inside or outside the *kampung* system, the Javanese population in the Ommelanden was no longer subject to the expulsion by the Company.

These Javanese provided a flexible labour pool for Chinese sugar entrepreneurs who wanted to draw full-time or seasonable workers for their plantations. Kanumoyoso's research of the notarial archive of the Company shows that an active Javanese labour market was operating in the Ommelanden at the beginning of the eighteenth century. Through middlemen, Chinese sugar planters could sign a contract with groups of Javanese workforce with a fixed wage. These labourers lived in cottages (*rumah petak* or *pondok*) provided by the planters and received food from them. As shown in table 5, each year, the planter should purchase 6 *lasten*, that is 12 tons, of rice for all the people living in his sugar plantation complex, and that would cost him 210 rijksdaalders.

3.2.2 Landless, small sugar entrepreneurs

Who were the sugar entrepreneurs who recruited these labourers and paid all these bills? In the archives of the VOC, they were usually collectively called Chinese sugar millers (*Chinese zuijckermolenaars*). In the survey report of 1710, it shows that there were 84 persons owning the 130 sugar mills. It also shows among these owners, except four Europeans and one Javanese regent, all of the rest (79) were Chinese, but it has no information on the names and background of each individual entrepreneur.[2]

An earlier report dated 1696 provided much detailed information. That report had never been sent by the High Government of Batavia to the Netherlands, but can still be found in the archive of the College of Heemraden in the National Archive of Jakarta (ANRI).[3] It was part of a comprehensive survey of all firewood-consuming industry, including sugar-making, distillery, brick-making, and et cetera., in the Ommelanden. This survey was ordered by the Council of the Indies because it felt concerns about the shortage of wood caused by unrestrained logging. The report illustrates not only the names and ethnicity of the owners of

[1] Niemeijer, *Batavia*, 101-102.
[2] De Jonge, *De Opkomst van het Nederlandsch Gezag in Oost-Indie,* vol. 8, 158.
[3] ANRI, College van Heemraden 7: 34B-53A, resoluties, 1696-1702, 15 Sep. 1696.

the 116 sugar mills in the Ommelandan, but also their locations, landownership and the time of their constructions and transactions. It is by far the most informative overview on the entrepreneurs in the sugar frontier and it has been compiled in a table in Appendix 1.

The Chinese were doubtless the most important sugar-mill owners in the Ommelanden, but, at the same time, they were also often without land. In general, the 116 sugar mills were owned by 94 investors, consisting of 76 Chinese, 5 Europeans, 5 Mardijkers, and 8 persons of unknown ethnicity. It is worthwhile to note that among them there were six female entrepreneurs who were mainly the widows and who owned 10 sugar mills. Apparently, the Chinese formed overwhelmingly the majority, and even in the case of the six female mill owners, three of them were Chinese. Two of these possessed seven sugar mills out of the 10 held in total by women. But at the same time, most Chinese sugar operators were landless. Except for the two Chinese sugar millers, all the rest of them rented land from others, mainly non-Chinese, to set up their plantations. Of these two exceptional Chinese landowners with their own sugar mills, one was the widow of Soucko, Niaij Tanhiantse, who owned 5 mills on her own land. In addition she leased out two plots to other Chinese millers. In comparison, all of the five European sugar mill owners had mills on their own land, and so is all of the five landowning Mardijkers. Hence, the majority of Chinese sugar millers owned no land but consisted of entrepreneurs who were attracted by the burgeoning sugar economy, while most of the non-Chinese millers were landowners who constructed sugar mills on their own land.[1]

Most of these sugar mills were fairly new. 80 out of the 116 sugar mills were built within 5 years ago, and the majority of the rest were built within 10 years. It means the massive construction of sugar mills took place from 1685 onwards. Most of sugar millers built mills by themselves but there were a few having purchased them from someone else. A general impression is that these sugar millers were running a start-up by taking advantage of the sugar boom since the 1680s. They erected new mills and opened up sugarcane fields attached with those mills in an frontier area which had yet to be reclaimed. This point can be testified by the locations of the mills. The 116 sugar mills were scattered all over the three directions of the Ommelanden. There were 35 in the eastern part, 47 in the south, and 34 in the west. Their locations were identified by the name of rivers that passed through them. By 1696, around all important rivers of the Ommelanden sugar mills had been installed. The most important river was the Ciliwung River, along which 47 sugar mills were situated . That river had the obvious advantage that it directly flowed through the Batavia city and had a vast drainage basin. But

[1] Ibid; Appendix 1.

not all sugar mills concentrated along that river. In Tangerang, at the boundary between Batavia and Banten, a Chinese entrepreneur had constructed a sugar mill on the land of the then Director General of the Company, Joan van Hoorn, in 1693.[1]

As most entrepreneurs had just started their plantation business, there had yet to be an apparent concentration of wealth. With her 5 sugar mills, the widow of Soucko, Niaij Tanhiantse, was in fact the largest sugar entrepreneurs. Immediately following her was Tanliancko(or Tanlianko), who had 4 sugar mills. Following them were two Chinese millers, Khouteeko and Soeijkiuko, who possessed three sugar mills. All other sugar millers, including Chinese and non-Chinese, had merely two or less mills under their control. A considerable proportion of them had only one half or even one third of the ownership of a mill, because many sugar mills were jointly invested by two or three shareholders. Those who had more than one sugar mill would usually have their mills in adjacent area such as along a same river. It seems there was no absenteeism among most sugar millers as these small sugar-millers personably took care of their few mills and supervised their daily operations. Besides that, it is common that people with different family names, the first syllable in Chinese names, could jointly hold one to three mills on a plot of land. It implies their investment was not bound by familial relation but was based on partnership.[2]

The report of 1696 was a testimony of a booming sugar frontier in its young stage. By that stage, there were very few large sugar entrepreneurs with their own land such as Tanhiantse, whose background we will look at to in the next section. The majority of sugar millers in the Ommelanden were small investors with two or even less mills. These sugar mills were often jointly invested by two or three people who usually had no familial link. If we take the fixed investment of a sugar plantation in the report of 1710 as a standard, that is, 3,868.36 rijksdaalders, what an investor should do was to obtain a moderate capital around that level, and then rent a plot of land from a landowner and construct one or two mills on that land. Thereupon he could recruit Javanese and Chinese labourers to prepare land for sugar cane cultivation. When the first harvest of sugar cane was ready after more than one year's growth, his sugar plantation complex would be able to bring him considerable profit, provided that the Company or private traders were to accept his sugar at a reasonable price.

[1] Ibid.
[2] Ibid.

3.2.3 Heemraden, cadastral maps and landownership

Whereas the sugar millers mainly consisted of small Chinese entrepreneurs without their own land, the background of the landowners who leased out land for sugar mills and plantations was much more complicated. They were from a very diversified ethnic group. The general picture was that there were two categories of land owners. One group consisted of Asian residents who were granted land by the Company to settle down in the Ommelanden, such as the Mardijkers, the Javanese, and the Makassarese. The other group was made up by company servants who were able to obtain land through the institutions under their influence. In any case, their landownership had to be recognized by the rural institutions of the Company, that is, the re-organized College of Heemraden.

The history of the re-organized College of Heemraden was linked with the son of the founding member of the old College of Heemraden. After Pieter van Hoorn lost power struggle in 1677, his son, Joan van Hoorn, was steadily climbing the ranks and an important milestone in his early career were his two appointments to the position of president of the College of Heemraden. After the old College of Heemraden's dissolution in 1672, a new College of Heemraden was founded in 1679.[1] Joan van Hoorn first presided that College of Heemraden from 11 August – 30 October, 1682.[2] In 1684, the new College of Heemraden was again dissolved and a renewed College of Heemraden was instituted.[3] In that re-organized Heemraden, it was specified that the president of the College of Heemraden should be a member of the High Government of Batavia, that is, the highest office of the VOC in Asia.[4] Joan van Hoorn became such a member in 1685 and presided the re-organized Heemraden from 5 May, 1685 – 22 July, 1687.[5] In 1690, he was promoted to Director General and, eventually, in 1704, to Governor General.

Joan van Hoorn's career in the Company was highly successful and so was his investment in the rural areas of that Company. When serving the Company, he acquired large tracts of land in the Ommelanden, of which a substantial part was rented out to Chinese sugar planters. In the survey report of 1696, he had 7 plots of land leased out to 8 Chinese sugar millers who had constructed11sugar mills there.[6] On 7 May, 1709, just few months before his

[1] J. A. van der Chijs, *Nederlandsch-Indisch Plakaatboek, 1602-1811, Derde Deel 1678-1709* (Batavia: Landsdrukkerij, 1886), 33.
[2] "Inventory van het College van Heemraden te Batavia," 10.
[3] Van der Chijs, *Nederlandsch-Indisch Plakaatboek*, vol. 3, 138.
[4] Ibid.
[5] Brommer, *To my dear Pieternelletje*, 235; "Inventory van het College van Heemraden te Batavia," 10.
[6] ANRI, College van Heemraden 7: 34B-53A, resoluties, 1696-1702, 15 Sep. 1696; Appendix 1.

retirement, he let the Council of the Indies pass a resolution to donate him a huge plot of land (ca. 2790 *morgens*) along the Tangerang River, on which he was allowed to set up two sugar mills.[1] He also extended credit to Chinese entrepreneurs who used their land estates as the guarantee and paid him at an interest rate of 6% per year.[2] The inventory of Joan van Hoorn dated 1711 shows there remained 79,704 guilders (26,568rijksdaalders) of land mortgages owed by the Chinese, even though by then Joan van Hoorn had already sold off most of his assets in Batavia when he resigned from the position of the Governor General and left for the Netherlands in 1709.[3]

Different from small landowners who personally took care of their real estates, Joan van Hoorn was a large absentee landholder just like the patrician class back in the Dutch Republic. He depended on a land registry system to secure his landownership in the rural area. The re-organized College of Heemraden played an crucial role in institutionalizing that system by establishing mapped cadastral survey.

Beforehand, only a few of land plans had been drawn by surveyors.[4] A plan, dated 1627, preserved in the family archive of Huydecooper, shows the dimensions of a small plot of land (ca. 2.67 morgens), and it was attached with an *erfbrief* (the title letter of that land) which shows the land relative position to its adjacent areas.[5] (Appendix 3) This kind of individual plans had yet to be not accompanied a systematic mapped survey, as even in the land survey of ca. 1650, the locations of land were still marked by their relative positions to each other instead of by its corresponding positions in a cadastral map.[6]

[1] NA, VOC 725: 224-225, Kopie Resoluties, 7 May, 1709.
[2] Brommer, *To my dear Pieternelletje*, 225.
[3] Idem, 326-327.
[4] Zandvliet, *Mapping for Money*, 153.
[5] Idem, 153-154; RAU, Huydecooper, 621 (1621-1638) (available online: http://www.archieven.nl/nl/zoeken?miadt=39&mizig=210&miview=inv2&milang=nl&micols=1&mires=0&micode=67&mip2=621, visited 23 December 2016)
[6] Brommer, *Historische Plattegronden*, 79-80.

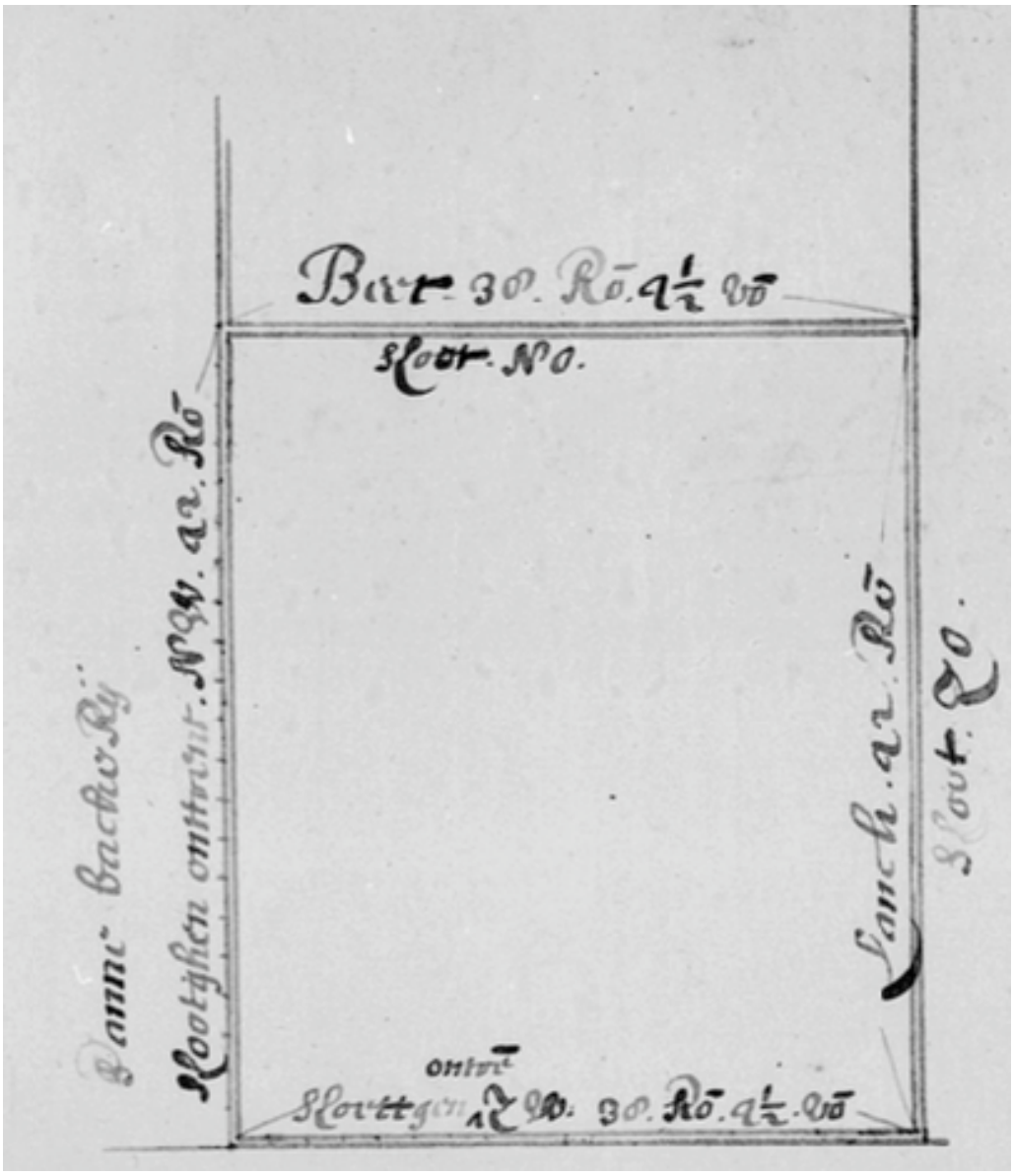


Illustration 6. Plan surveyed and mapped by Frans Florisz van Berckenrode, in the family archives of Huydecooper (1627).[1]

That situation began to change in 1680, when a land surveyor (*landmeter*) in charge of land beyond the city wall of Batavia was specifically appointed.[2]In 1684, there began to be a clear demarcation of duty between *landmeters*, who was in charge of the land beyond the city wall and worked under the college of *heemraden*, and *rooimeester*,who was in charge of the land within the city wall and worked under the college of *schepenen.*[3]

In the archives of the College of Heemraden, there are many resolutions dealing with landowners' applications of mapped land survey in order to (re)confirm their landownership during the 1680s. The case in a resolution dates 19 May, 1685 is particularly interesting since

[1] RAU, Huydecooper, 621 (1621-1638).
[2] Van der Chijs, *Nederlandsch-Indisch Plakaatboek, 1602-1811,* Vol. 3, 66.
[3] Idem, 131.

it concerns the important female sugar entrepreneur, Niaij Tanhiantse. As already mentioned, Tanhiantse was the widow of Soucko (Li Tsoeko, or Li Zuge). According to Tanhiantse's statement, Soucko had purchased a plot of land in Tanah Merah, nowadays Tanah Abang, from the Chinese Captain Bingam who in turn originally obtained that land from the Governor General Cornelis van der Lijn in 1650 and had constructed a sugar mill there. Besides that, that couple also had several lands along Grogol and Ankee, and had built two sugar mills over there. The eastern part of their land had been well cultivated, but the western part remained wild because of the attacks of the Bantenese around 1680 which also killed Soucko. After security was restored by the Company in the 1680s, Tanhiantse decided to reclaim the western part as well. She hired a surveyor, Verbergmoes, to measure the eastern part of her land and make a map. Now she requested the College of Heemraden to assign the same surveyor to measure and produce a map for the western part of her property in order to make it complete. The College of Heemraden, then headed by Joan van Hoorn, agreed that request and order the surveyor to make a new and perfect map for Tanhiantse.[1]

With these individual land maps, the surveyors under the College of Heemraden gradually compiled a set of cadastral maps. Four of these maps are nowadays preserved in the map collection (VEL)of the *Nationaal Archief* in Den Haag.[2](Appendix 4) These four maps belong to one set of mapped cadastral survey and represent four direction of the Ommelanden. The four maps are not dated, but based on the latest land transaction date (August, 1706) on them, it can be conjectured that they were finalized around the end of 1706. These four maps collectively covered the major part of the Ommelanden which had then been subject to land reclamation, but had not extended to remote areas as Tangerang.

Without any legend, the information contained in these maps has to be uncovered through close observation and comparison. Basically, these maps tell very little geographical information, but relatively rich cadastral information. In terms of geography, only rivers, few roads, coastline, castles, few houses, and some decorative trees were depicted. Its lack of geographic information is actually understandable, because the very function of these maps was to define the boundaries between different land properties and to measure the size of each land property. It has two kinds of lines to achieve these goals. The solid line represents the boundary, which always shows length and directions; the dotted line was added when it was

[1]ANRI, College van Heemraden 5: 21, resoluties, 1682-1687, 19 May. 1685.
[2] NA, VEL 1184-1187
(available online: http://www.gahetna.nl/collectie/archief/ead/index/eadid/4.VEL, visited 23 December 2016).

necessary to elaborate the size of the land. Both the solid line and dotted line used the points of the compass. For instance, next to one solid line, it is noted "O:N:O: en W:Z:W: 232 : roeden". This means the boundary between these two pieces of land is from East-northeast to West-southwest with the length of 232 *roeden*. It implies a kind of triangulation might have been used in the survey.

More interesting is the text on the maps. Firstly, It shows the owner's name of each plot. While most plots are not numbered, there were letters in Capital, such as A, B, C, and D, after the owners' names, when it was necessary to distinguish different pieces of adjacent land which belonged to same owners. Besides that, in many case, the origins and the transactions of the landownership were also noted. It shows most land was originally given through donation by the Company, and some of it had been since then inherited, sold, or leased. Besides that, there were also a considerable number of lands owned by the Company but possessed (*bezeten*) by or leased (*verhuurd*) out to usufruct holders. Usually those with Indonesian names possessed the Company's land and those with Chinese names rented the Company's land. In the latter case, the amount of annual rent was often specified. The majority of the donations and transactions took place in the 1680s and 1690s. This testifies that the reclamation of the Ommelanden had accelerated after the re-establishment of the College of Heemraden (1679) and the coming of sugar boom.

These maps by themselves contain no information of sugar, with which the connection should be found elsewhere. Such a link can be made with the help of the above mentioned sugar report made by the College of Heemraden in 1696. That report shows the 130 sugar mills were most concentrated along the Ciliwung River (47 mills) and the Passangrahan River (26 mills).[1]

Among these two rivers, the Ciliwung flew through the city of Batavia and had the best access to the market of Batavia. Therefore, it downstream section had been canalized and had intensely cultivated by the end of 17th century, but its upriver remained as a frontier area with a large number of sugar plantations. The cadastral maps also show there were some big estates beginning from the point where infrastructure such as canals, roads and castles ended. In a section relatively closer to the city, large-scale estates were mainly owned by Europeans. (Illustration 7)There were rich burgers, such as Hendrik Christoffels Leser and Cornelis Chastelijn, and important Company personnel, such as the Governor General, Joan van Hoorn, his successor as Governor General, Abraham Riebeek, and the former governor of

[1] De Jonge, *De Opkomst van het Nederlandsch Gezag in Oost-Indie*, vol. 8, 158.

Coromandel, Antony Paviljoen. Among them, there were three sugar mills on the land of Chastelijn and two on the land of Leser, but we are not sure how many were on the land of Van Hoorn on that section, since the eleven sugar mills on his land were scattered in different locations, situated on the different sections of Ciliwung.

Illustration 7. Landownership along a lower section of the Ciliwung River (De Groote Rivier), VEL 1184.

Upriver into the hinterland, the landownership became much more complicated. The Europeans were no longer the dominant landowners, although they still held the biggest estates. Besides them, the elites among the Asian residents, such as the leader of *kampungs* began to hold big estates. Taking an upstream section of Ciliwung as example, the landowners include Joan van Hoorn, who had two enormous plots; a Makassarese leader, Dain Matara, who possessed a huge plot of land with the people in his *kampung*; a Mardijker, Diogo Merendo (Mirando), who had two smaller pieces of land;[1] Simoa Rodrigo, who was likely also a Mardijker; and a Chinese sugar miller, Tan Lianco (Tanlianko). (Illustration 8) According to the survey report of 1696, all of these landowners had either their own or their tenants' sugar mills on their land. Besides the already discussed case of van Hoorn, there were

[1] Dain Matara (Daeng Mattara) was the Captain of the Makssarese *kampung* and his land was not donated by the Company but only under the possession (*bezig*) of him and his people. VEL 1186; Niemeijer, *Batavia*, 102.

3 sugar mill on the land of Matara, 5 on the land of Merendo (Mirando), 1 on the land of Rodrigo, and 3 that of Tan Lianco (Tanlianko).

Illustration 8. Landownership along a upriver section of the Ciliwung River (De Groote Rivier), VEL 1186.

The landownership along the Passangrahan River was as intricate as Ciliwung, but a unique feature here were the large estates on its lower section, owned by the extraordinary female Chinese sugar entrepreneur, Niaij Tanhiantse. Tanhiantse belonged to the Chinese elite community in Batavia. Her late husband had previously served as *boedelmeester* and Chinese lieutenant, and was the guardian of the son of the first Chinese Captain, Ben Con.[1] She married her daughter to the son of Ben Con, and their tombs were situated next to that of Ben Con.[2]Thanks to these relations, in 1685, Tanhiantse was able to let the College of Heemraden survey and reconfirm the ownership of her land around the Passangrahan River by making a

[1] Blussé trans., "Kai Ba Lidai Shiji" [A Chinese chronicle of the historical events at Yaolaoba (Kelapa)], 42; B. Hoetink, "Chineesche officieren te Batavia onder de Compagnie," *Bijdragen tot de taal-, land- en volkenkunde* 78: 1 (1922): 96-97.
[2] Ibid.

new and perfect map.[1] In 1686, she even requested the Company to send two of her daughters back to China with a Company's ship in order to make sure them to been raised up in a best way.[2] Tanhiantse's land concentrated along Passengrahan. She had four plots of land along the Passengrahan River, one along the Grocot River,and one under the name of her son, Lie-Gieko, along the Passengrahan River as well. On these lands, there were seven sugar mills. Two of her largest lands can been seen in a part of the cadastral maps, Illustration 9 (below), which shows they were either donated or given (*verschicking*) on 31 July 1688. Since Tanhiantse and her late husband had owned land there long before that date, it is likely after her application in 1685, the Company surveyed her land and certified new title letters to her in 1688.

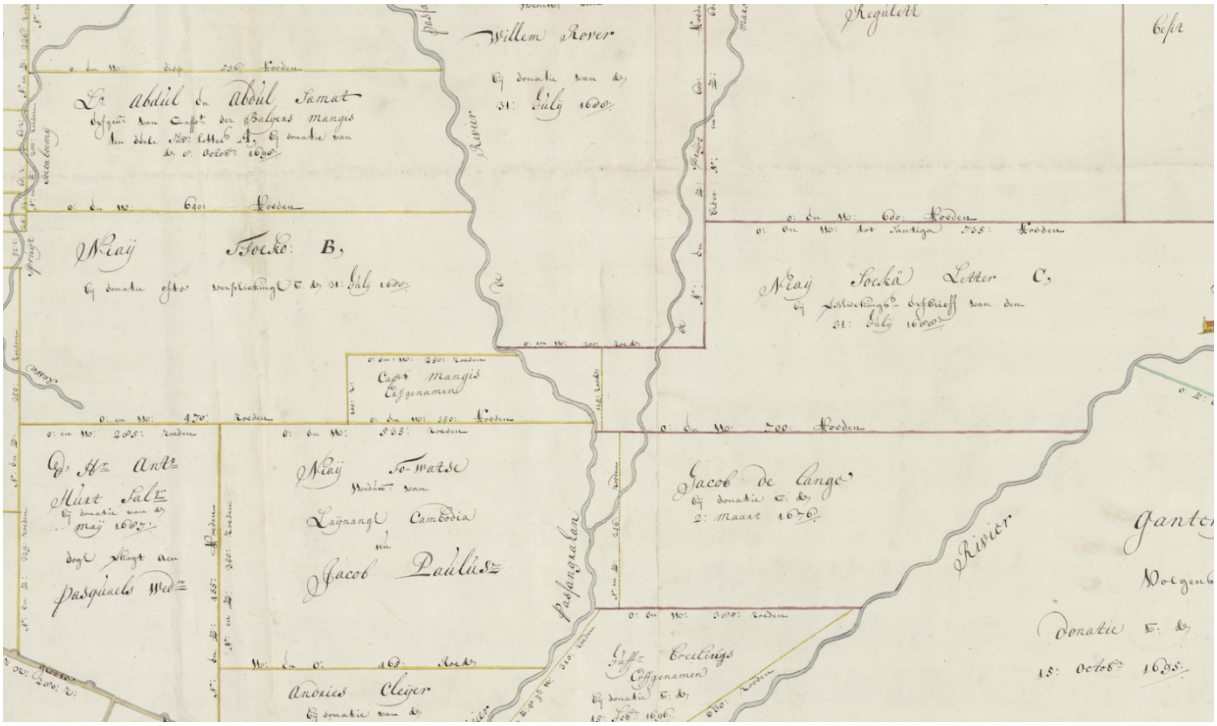


Illustration 9. Two Estates of Niaij Soeka (Niaij Soucko, or Niaij Tanhiantse) along the Passangrahan River, VEL 1185.

With these sampled cases along two major rivers of the Ommelanden, what we can see is that there were mainly three groups of people who could put their names on the cadastral maps of the College of Heemraden. They were either the Company personnel, like Van Hoorn; the Asian elite who were granted land by the Company to settle down in the Ommelanden, such as the Captain of Makassarese, Dain Matara; or the Chinese elite who had deep roots in Batavia, such as Niaij Tanhiantse. In stark contrast what is missing on the cadastral maps are the names of the majority of the Chinese sugar millers and the labourers working under them.

[1]ANRI, College van Heemraden 5: 21, resoluties, 1682-1687, 19 May. 1685.
[2]Hoetink, "Chineesche officieren te Batavia onder de Compagnie," 97.

As long as the booming period was in full swing, such a relation would not hinder the expansion of sugar frontiers, since the landowners could obtain new land far into the hinterland from the College of Heemraden, while the sugar millers could rent these unclaimed lands and set up new plantations there. That division of speciality benefited both and may have even stimulated the expansion. But when the sugar boom ended and the Company began to control the number of plantations, new adjustments had to be made in order to sustain the already achieved prosperity.

3.3 Sustained prosperity, 1700s-1730s

From a humble beginning, the number of sugar mills in the Ommelanden dramatically increased from around 10 to 130 during the few decades before 1710. But, in the following period, the growth halted and the number of sugar mills stayed stable around the level of 1710. (Table 5) Apparently the age of rapid expansion was over, but it does not mean the sugar frontier was in crisis. Instead, until the sudden collapse of sugar price in 1734, the market was running stably without much fluctuation, new sugar plantations were continuously set up in remote frontiers and replaced the old ones, in short the whole system functioned on its peak level. The questions to be discussed in this section are how that prosperity was sustained and whether some seminal changes occurred during this seemingly stagnant period.

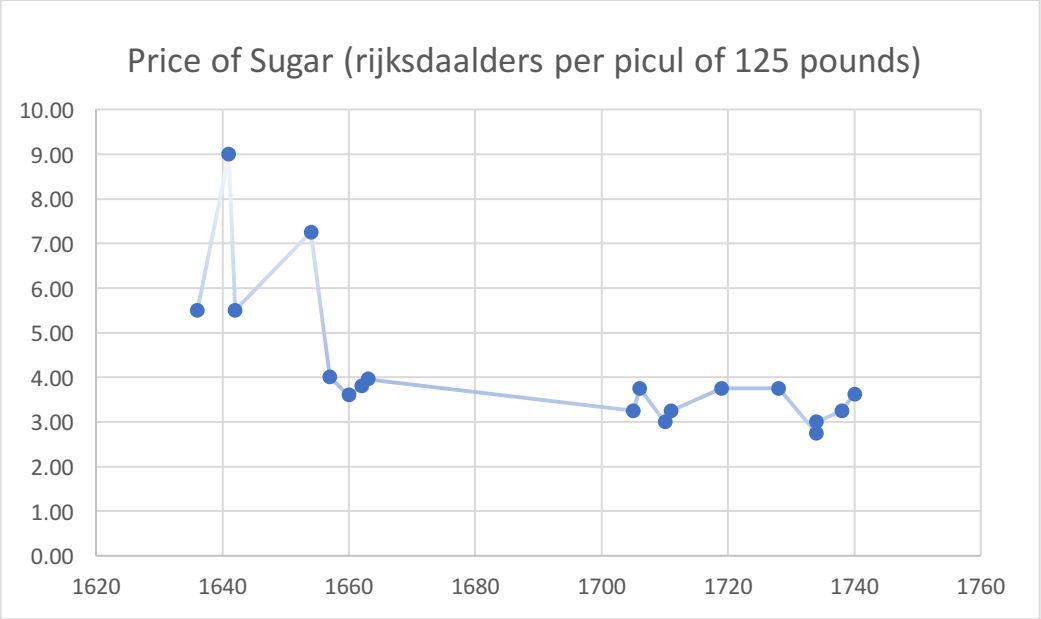
Year	Number of sugar mills	Sources
1656	22~23	NA, VOC 663, Kopie-resoluties, 9 Mar. 1660.
1660	8~10	NA, VOC 663, Kopie-resoluties, 9 Mar. 1660.
1696	114	ANRI, College van Heemraden 7: 34B-53A, resoluties, 1696-1702, 15 Sep. 1696.
1710	130	De Jonge, De Opkomst van het Nederlandsch Gezag in Oost-Indie, vol. 8, 157-164.
1713	128	ANRI, College van Heemraden 13: 375, resoluties, 1716-1717, 27 Jul. 1717.
1734	135	NA, VOC 762: 121, Kopie-resoluties, 9 Aug. 1738.
1738	80	NA, VOC 762: 121, Kopie-resoluties, 9 Aug. 1738.

Table 5. The number of sugar mills in the Ommelanden (1656-1738).

3.3.1 Behind the price of sugar

The most crucial contributor to the sustenance was a stable price of sugar. As we can see from the Graphic 1, such a stability had been generally maintained during the period from 1710 until 1734. In those years, the average price of sugar was moderately fluctuating between 3

and 4 rijksdaalders. How could it be achieved? Was there any new development behind the stable price of sugar?



Graphic 1. The average price of sugar, based on Table 8 (1636-1740). (Based on the Calculation made in Appendix 2)

First, we should go back to the price of the preceding booming period, which can be calculated with the help of the sugar survey report of 1710. The report concludes an account of the amount of sugar purchased by the Company in Batavia and its value. It shows from 1680-1709, the VOC purchased 68,425,711 pounds (ca. 547,406 piculs) of powder sugar in the Ommelanden for its markets in the Netherlands, Japan, Persia, Surat, Malabar, Choromandel, and Mocha. For that, the Company paid 5,759,973 gilders (1,919,991 rijksdaalders).[1] The average price of sugar during these booming decades was hence 3.5 rijksdaalders per picul.

That price was very close to the average (3.34) of the moderately fluctuated price of sugar in the following decades.[2] (Appendix 2) Around that price, the Company and the Chinese sugar-millers negotiated all the way from the beginning of the eighteenth century to the eve of the Chinese rebellion in 1740. Their negotiations were not one-sided and the price of sugar was also largely confined within a range between 3 and 4 rijksdaalders which depended on the market condition. The mechanism which contributed to that balanced price can be elaborated with a series of resolutions concerning the adjustments of sugar price during that period.

[1] After the 1650s, one rijksdaalder in the Dutch East Indies was worth 60 stuivers and hence 3 gilders, instead of 2.5 guilders. Glamann, *Dutch-Asiatic Trade, 1620-1740*, 55.
[2] Appendix 2, Table 9.

The first resolution is a report concerning a smuggling case near Batavia, which shows an interesting factor in influencing the price of sugar, that is, the private trade. In 1705, the VOC uncovered a sugar smuggling chain. It shows a English ship, the Pieton Malsen, anchored on a roadstead near Batavia and loaded sugar from four *prahus* and one *tingan* of indigenous people.[1] When the Company's *syahbandar* arrived there, he found the four *prahus* had been emptied but the *tingan* remained with 78 bags (*kanassers*) of sugar. When he got aboard of the English ship, he found there was a young man who was a slave of a citizen (burger) of Batavia, Pieter Oliviers. The Company ordered the detentions of all indigenous ships as well as the their crew and the slave, and summon two suspected citizens.[2] After days' interrogation, a Chinese merchant, Oeij Kocke, was also detained, since the 78 bags of sugar found in the *tingan* was actually purchased by him in the name of delivery to the Company. It was discovered that Oeij Kocke purchased the sugar on the Maronde River and then these indigenous ships transported them to the English ship, which anchored outside the Sontar River, with the coordination of these European citizens.[3] Because neither river passed the Batavia City, this means the Company was not able to effectively monitor the outflow of sugar from the Ommelanden to the sea via these small rivers.

A lesson learned by the Company in this case was that the price of sugar in the private market was higher than that offered by the Company. The sugar millers were supposed to deliver all their sugar to the Company, but as having been discovered by the Company, there was always private traders in competition. In 1705, when the Company could only offer 3 rijksdaalders per picul, the private traders were purchasing a large part of Batavia sugar at 3.5 rijksdaalders per picul or even higher. Considering that, the Company conceded to the sugarmillers' request, which had been appealed many times before, to raise the price of sugar from 3 rijksdaalders per picul to 3.5.[4] In 1706, sugar price in the private market went up again and the Company were obliged to 4 rijksdaalders per picul; before that, the sugar millers delivered little or almost nothing (*tot weinig of bijna niets*) to the Company.[5]

The problem of private trade was linked with another embarrassing issue, that is, the Company was not able to directly control the supply of sugar in the Ommelanden. To begin with, the Company's demand of sugar varied enormously each year owing to the changing orders from the Netherlands, Persia, Japan, and all its trading posts in the Indian Ocean. It was

[1] Both prahus and tingan are small Southeast Asian ships.
[2] NA, VOC 720: 635-636, Kopie-resoluties, 9 Oct. 1705.
[3] NA, VOC 720: 643, Kopie-resoluties, 13 Oct. 1705.
[4] NA, VOC 720: 636-637, Kopie-resoluties, 9 Oct. 1705.
[5] NA, VOC 722: 574-575, Kopie-resoluties, 5 Aug. 1706.

not an easy task to convene the information of the changing demand of sugar timely to sugar millers. The information and also the market were rather channelled by a group of agents between the sugar millers and the Company. As what had happened in the smuggling case of 1705, the sugar millers were not selling sugar directly to the Company, but to a Chinese merchant, Oeij Kocke.[1] After cornering that sugar supply, Oeij Kocke could either deliver it to the Company or to an English ship. It means the price of sugar given by the Company was not the price of sugar enjoyed by the sugar millers. It was these middlemen who balanced the supply and demand between sugar millers on the one hand, and, the Company and the private traders on the other. That issue was also identified by the sugar survey committee of 1710 as a major problem in the sugar economy of the Ommelanden, when the sugar millers complained that they could only select between keeping sugar in their hands or delivering it to rich pre-buyers (*voorkoopers*) against a lower price.[2]

In order to regulate the uncontrolled supply of sugar, the Company henceforth tried to control and manage the number of sugar mills under a license system and to regulate delivery quota of each plantation. It is not clear when the Company started to require a license for each sugar mill. The survey of 1696, which listed all sugar mills in the Ommelanden, may have partly served that purpose.[3] In 1709, Oeij Koenko, a Chinese sugar miller who applied to build two mills, was found out to have already constructed one of the sugar mills before getting a license, and was hence fined 100 rijdsdaalders.[4] The survey of 1710 made the Company further determined to restrict the construction of new sugar mills.[5] A placard was issued on 10th October, 1710, that no new sugar mill would be allowed to build near Batavia, in order to prevent the emaciation of land fertility and the shortage of firewood.[6] Also on the same day, a resolution was passed which regulated each sugar mill in the Ommelanden would be allowed to deliver 300 piculs of powder sugar each year.[7] That policy was originally designed to give each miller equal opportunity to deliver sugar at same price.[8]

[1]NA, VOC 720: 643, Kopie-resoluties, 13 Oct. 1705.
[2] Van Swoll and van Zwaardekroon, "Uittreksel uit een Rapport en uit de bijlagen over de suijkercultuur", 163-164.
[3] ANRI, College van Heemraden 7: 34B-53A, resoluties, 1696-1702, 15 Sep. 1696.
[4] NA, VOC 725: 223-224, Kopie Resoluties, 7 May. 1709.
[5] Van Swoll and van Zwaardekroon, "Uittreksel uit een Rapport en uit de bijlagen over de suijkercultuur", 164.
[6] Van der Chijs, *Nederlandsch-Indisch Plakaatboek 1602-1811*, Vol. 4, 6.
[7] NA, VOC 726, Kopie resoluties, 10 Oct. 1710.
[8] Van Swoll and van Zwaardekroon, "Uittreksel uit een Rapport en uit de bijlagen over de suijkercultuur", 164.

In general, the Company successfully controlled the number of sugar mills. There was only a slight growth of the number of sugar mills 1696 to 1710.[1] During these years, people with powerful background, such as Joan van Hoorn, could easily obtain licenses to build sugar mills on their lands, but it was already difficult for moderate merchants, such as Oeij Koenko to obtain such a license.[2] During that period, the number of the registered sugar mills grew from 114 to 130.[3] After the prohibition of new sugar mills in 1710, it had become even more difficult. Whereas there were already 130 sugar mills in 1710, only 128 mills were registered in 1713 and there were still only 135 mills in 1734.[4] There was hardly any substantial growth, but neither decline.

In comparison, the quota system, which aimed to give each sugar miller equal opportunity and same price, seems to have never been seriously practised. In 1728, the Company was forced to raise its sugar price because they offered special price to privileged suppliers. It shows, two years ago, the Company purchased 2,042 piculs of sugar from the Chinese Captain, Que Bauqua, and the former Chinese boedelmeester, Ni Locko, at a price which was 0.5 rijksdaalder higher than the other sugar millers could officially enjoy.[5] Thereafter, all sugar millers requested to enjoy that price and complained their ruins were immediate if the Company insisted to discriminate them with the lower official price.[6]The Council of Indies discussed that issue and found that the quota of 300 piculs for each sugar mill in 1710 had been barely executed and the Company might be able to receive enough sugar within 2 years if they could not relieve the impoverishedsugar millers.[7]

The often alleged poverty among sugar millers notwithstanding, the real situation was that wealth was increasingly concentrated into a few privileged sugar entrepreneurs. The best known example was the family of Ni Locko. In 1725, just one year before he enjoyed the privileged price from the Company, Ni Locko was allowed to build an arak distillery in order to process the huge quantity of syrup from his nine sugar mills.[8] Ni Locko's son, Ni Hoekong, was another active sugar entrepreneur. According to Hoetink's research, Ni Hoekong had about 13-14 sugar mills under his name, which were partly passed down by his father and

[1] Table 5.
[2]NA, VOC 725: 223-225, Kopie Resoluties, 7 May. 1709.
[3] Table 5.
[4]Ibid.
[5] NA, VOC 744: 447-453, Kopie-resoluties, 27 Jul. 1728.
[6] Ibid.
[7] Ibid.
[8] B. Hoetink, "Ni Hoekong Kapitein der Chineezen te Batavia in 1740," *Bijdragen tot de taal-, land- en volkenkunde* 74:1 (1918): 448.

partly acquired by himself.[1] Ni Hoekong also inherited his father's position of Chinese lieutenant in 1733, and in 1736 he became the Chinese Captain.[2] During that period, Ni Hoekong had planned to expand his sugar frontier to the west coast of the Tangerang, which had crossed the boundary between Batavia and Banten. His request of renting a large piece of the Company's land (600 morgen) against 400 rijksdaalders per year there was refused by the Council of Indies in 1734 because of the possible disputes with the Bantenese, but he was allowed to move one sugar mill from Passangerahan to Tangerang in 1736.[3]

Therefore, under the seemingly stable price of sugar, there was an active sugar market and around that market there existed complicated relations between the Company and the sugar millers. On the one hand, the sugar millers had a choice other than the Company, because there was a private market which could balance the difference between the relatively stable sugar supply from the around 130 millers and the fluctuating demand from the Company. On the other, the Company was also not fair to all sugar millers as it had never equally purchased sugar from all sugar millers. Indeed, the unrealistic quota of 300 piculs of sugar per miller was also too small, considering that real production of each mill was about 800 piculs according to the report of 1710.[4] Those who benefited from that relation were the in-between sugar traders, or the so-called pre-buyers (*voorkoopers*), and the privileged sugar entrepreneurs, such as Ni Locko and his son Ni Hoekong. Until the Company suddenly broke the balance by dramatically lowering the price of sugar in 1734, all these parties could still enjoy profit although the share of which was not fair to the unprivileged, small sugar entrepreneurs.

3.3.2 Within a sugar plantation

The price of sugar could only reflect the relation among sugar mill owners, traders and the Company. The majority of the people living in the sugar plantation society had no voice in that relation. They were labourers and technicians who worked and lived in individual plantations. To understand their plantation life, it is imperative to make close examination of individual sugar plantations in the Ommelanden. Both the cadastral maps and the survey reports could not serve the purpose, since they tended to give reductive depictions and to generalize the situation. What is real germane to our enquiry is the original survey plan of

[1] Ibid.
[2] Idem, 447.
[3] NA, VOC 754: 122-123, Kopie-resoluties, 9 Nov. 1734; Hoetink, "Ni Hoekong Kapitein der Chineezen te Batavia in 1740," 448.
[4] Van Swoll and van Zwaardekroon, "Uittreksel uit een Rapport en uit de bijlagen over de suijkercultuur", 160.

each estate. Fortunately, there are six such kind of estate (*landerij*) maps preserved in the map collection (VEL)of the National Archive in Den Haag and could easily be accessed online.[1]

All of these six reports were issued by one land surveyor, Boudewijn Jansz. Vonk, and on a same day, that is, 11 October 1732. These six reports corresponded to six estates (*landerijen*), among which four had sugar plantations. According to the text under the maps of each report, one of the lands which had sugar plantations was owned by the Governor General and the other three by the councillors or extraordinary councillors of Dutch India. Each plan had a surveyed map, on its upper-side, and on its lower-side, there is a legend and a statement by the land surveyor.

On the plan issued for the extraordinary councillor, Wouter Hendrix, the sugar plantation was along the Tsiakong River. The size of this plantation was enormous. Based on the dimension given in *Rijnland Roeden*, it covered an area of around 2460 morgens (ca. 25 km²), almost 35% of the size of Beemster (72km²).It had two sugar mills, twelve plots of sugarcane fields , many small plots of paddy fields, and a small mulberry garden. The sugar cane fields were not next to river, while most paddy fields were adjacent to the waterways. It implies sugar cane fields were not necessarily irrigated, while paddy fields needed immediate access to water. Besides these cultivated lands, there were several small plots of woodland, but the majority of land was wasteland that had been deforested. There was also some land which was previously planted with sugarcane but had been abandoned then. The whole plantation complex was not attached to a local village, although there were a few cottages which should be for the accommodation of plantation labourers. A further interesting observation is that the estate was surrounded to the north, east and south by the lands of two prominent Chinese sugar entrepreneurs, Ni Locko and the son of the late Chinese Captain, Que Bauqua. Hence, that sugar plantation was likely not isolated but was in an area where plantations had been proliferated.

[1] NA, VEL 1240-1245.
(available online: http://www.gahetna.nl/collectie/archief/ead/index/eadid/4.VEL, visited 23 December 2016).

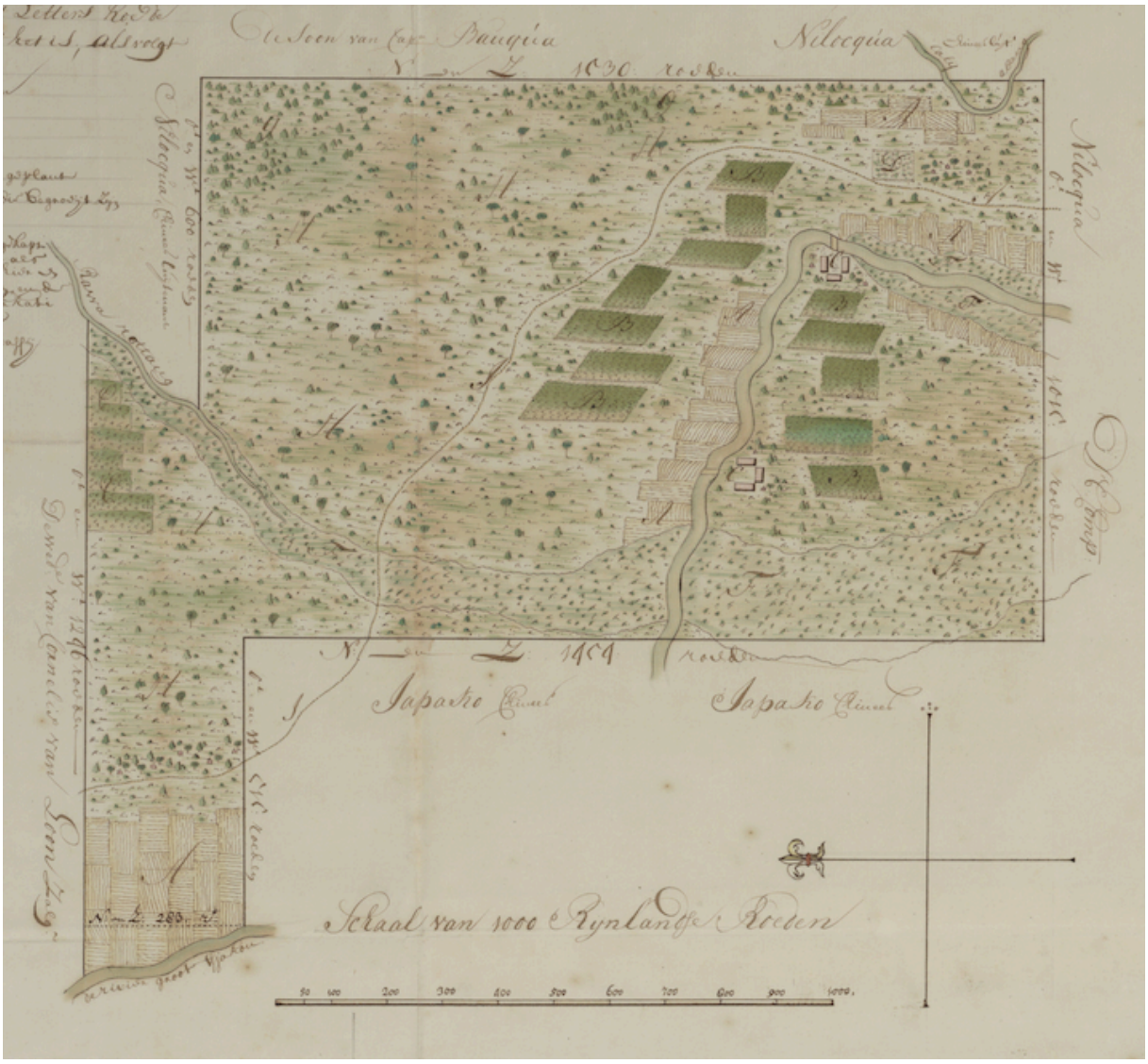


Illustration 10. The Estate of Wouter Hendrix along the Tsiakong River. (Nationaal Archief (NA), Den Haag, VEL 1244)

A general impression is that, although the size of each plantation was tremendous, only a small part of it was cultivated and the majority was the waste land which had been either deforested or abandoned. This kind of inefficient land use was related with how sugar was made in the Ommelanden. The sugar-making technology in the early modern Ommelanden was originally transferred by Chinese immigrants.[1] This technology was ecologically sustainable on the Southeast China Coast and Taiwan. The bagasse of the crushed sugarcane could be used as fuel for boiling sugar juice,[2] and the fields for sugarcane cultivation was subject to rotation with other crops and was fertilized by night soil, soybean cake, or peanut cake.[3] However, when the Chinese from the Southeast China Coast moved to the Ommelanden, they changed their sustainable tradition with exploitive ways. The firewood cut

[1] Kanumoyoso, "Beyond the City Wall," 155-161.
[2] Daniels, *Agro-Industries: Sugarcane Technology*, 358.
[3] Idem, 242; 250-251.

from the jungle replaced bagasse and the exhausted farmland was quickly abandoned rather than carefully maintained and fertilized.[1]

Even the sugar entrepreneurs who organized these plantations lacked motivations to operate their plantations in an ecologically sustainable way. According to the survey report of 1710, 51.11% of the running cost of a plantation consisted of the wages to the labour. Only 550 rijksdaalders, that is, 18.71% of the total running cost, were for fetching firewood (400 rijksdaalders) and land rent (150 rijksdaalders).[2] Comparing with the cost of labour, firewood and land were of much lower value. Even as late as 1790, when firewood shortage had become a desperate issue, the sugar planters were still reluctant to use pressed sugar bagasse to fuel their stoves, because it would cost them a lot to prepare the bagasse by collecting them and then binding them into bundles.[3] The point is when the sugar economy was operated in a plantation way, the sustainability of the land was always second to the immediate profit of the entrepreneurs.

The consequence of this destructive agro-industry was that the sugar frontier of the Ommelanden was moving over time and the Javanese and Chinese labourers were also moving. Once firewood and fertile land of one estate had been exhausted, they would move to another place. As noted by Raben, "the first mills stood along the Ciliwung [the modern name of the Groote River], but gradually shifted away from the town to the rivers east and west."[4] On the one hand, this process was responsible for the rapid deforestation of the Ommelanden, which completely transformed its landscape;[5] and on the other hand, this process also caused the Javanese and Chinese labourers consistently in a status of movement.

Why could not these labourers be settled down in the Ommelanden and then take good care of their own land as back in China? The problem is that it was virtually impossible for an average Chinese immigrant or a Javanese labourer to obtain a piece of land through the College of Heemraden. The system of registering land in a surveyed map was very complicated and expensive. The landowners had to make a formal request in the meeting of the College of Heemraden, and if approved he had to pay the land surveyor a decent salary to travel from the Batavia city to his estate in the Ommelanden to make a survey.[6] Furthermore,

[1] Raben, "Batavia and Colombo: The Ethnic and Spatial Order of Two Colonial Cities," 62; Blussé, *Strange Company*, 26-27.
[2] Table 4. Fixed investment and running cost of a sugar plantation in the Ommelanden(1710).
[3] Teisseire, "Verhandeling over den tegenwoordigenstaat der suikermolens omstreeks de stadt Batavia," 207.
[4] Raben, "Batavia and Colombo: The Ethnic and Spatial Order of Two Colonial Cities," 62.
[5] Blussé, *Strange Company*, 15-34.
[6] Chijs, *Plakaatboek, 1602-1811, Derde Deel 1678-1709*, 184-188.

if he was going to engage in sugar agro-industry, he should further obtain a license from the College of Heemradento set up a sugar mill.[1] The whole system would only facilitate the elite in Batavia to partition the land of the Ommelanden via maps and to obtain special permissions to set up sugar mills in their land, because they were acquainted with the members of the College of Heemraden and they also had sufficient capital to do so. Therefore, in the cadastral maps, we can only find big names with large plots of land.

In comparison with the Javanese labourers, the opportunity of getting settled in the Ommelanden was even more meagre for the Chinese. As mentioned earlier in this chapter, the VOC had a *kampung* system to settle indigenous people, such as the Javanese, in the Ommelanden, but the Chinese were not subject to that system. There were Javanese *kampungs*, Ambonese *kampungs*, Balinese *kampungs*, Makassarese *kampungs*, and Bugis *kampungs*, but no Chinese *kampung*.[2] The *kampong* system allowed these indigenous people of the Dutch East Indies to settle down in some designated areas in the Ommelanden and to live under their own headmen.[3] These people could farm their own small plots of land through that system and became the settled population there, but the Chinese could not.

Denied by the system of getting settlement right in the Ommelanden, the Chinese immigrants were expected to be subject to their own leader who was the Chinese Captain residing in the Batavia city.[4] It means the rural Chinese were supposed to be controlled by urban Chinese elite and the leadership of these Chinese elite became a decisive factor. As noted by Blussé, when the Chinese Captain was a charismatic leader, these rural Chinese immigrants would be willing to follow his order; but, when the Chinese Captain became a position increasingly monopolized by some elite families such as that of Ni, who possessed large plots of land and many sugar plantations in the Ommelanden owing to their close connections with the VOC; their connection with Chinese labourers could become relatively weak and the situation could be easily out of control.[5]

[1] Kanumoyoso, "Beyond the City Wall," 150-151.
[2] Idem, 54-60.
[3] Ibid.
[4] Raben, "Batavia and Colombo: The Ethnic and Spatial Order of Two Colonial Cities," 200-203.
[5] Blussé, *Strange Company*, 87-90.

Conclusions: Singular but not isolated frontier society

The plantation society in the Sino-Dutch sugar frontiers was like no others. It was *not* simply an extension of Chinese sugar to an overseas frontier. Indeed, in the early stage, the Ommelanden of Batavia and Saccam of Dutch Formosa simultaneously copied sugar-making expertise from China through Chinese agents, but since then they had evolved along different paths. Whereas the sugar agro-industry in Dutch Formosa was deeply embedded into a Chinese agricultural settlement society and resembled the Chinese way, the Ommelanden developed a plantation society as we have never seen before. It had become completely different from Chinese sugar around 1650.By then, the so-called "sugar revolution" had taken place in the Ommelanden as in contemporary Barbados. In that revolution the plantation owners melted the boundary between agriculture and industry by integrating sugarcane cultivation and sugar-making into one plantation complex. That change had never happened in early modern China, including in the successor of Dutch Formosa, Taiwan.

At the same time, there was a critical difference between the plantation complex in the Ommelanden and in the West Indies, that is, labour. First, the size of labour force in the plantations of the Ommelanden was smaller than that in Barbados. Whereas the size of the plantation labour in the Ommelanden was about 30-40 persons, that in Barbados had sometimes passed over 100 since the 1640s.[1]Throughout our research period, the plantations in the Ommelanden were basically of that small size, and only in the late-eighteenth century, they began to grow as big as that in the West Indies. The second crucial difference is the nature of labour. In the early stage, the Ommelanden's plantations employed both Chinese immigrants and slaves, but since its booming period in the 1680s, slaves had been completely replaced by cheap Javanese labourers and even the Chinese were squeezed out from the low-payment positions. The lack of slavery in the plantations of the Ommelanden offers an intriguing comparison with the slavery system in the Atlantic, which was so much ingrained in people's imagination of sugar plantation society. The implication of these differences deserves much more nuanced discussions which should be elaborated in future researches.

These singular developments notwithstanding, the Sino-Dutch sugar frontiers were, at the same time, extremely well connected with the rest of the world. Its landownership, which deprived the labourers of the settlement right, was a witness of the profound influence of the Dutch cadastral survey tradition upon early modern Asian society. Its market was not protected by a mercantile system but was consistently subject to competition from the West

[1] Dunn, *Sugar and Slaves*, 46-83.

Indies sugar in the Atlantic and from the Chinese and Bengalese sugar in Asia. Its labourers and capital were from China, Java, and Europe. Its technology was virtually a wholesale copy from China, although in its development, it had become much less ecologically sustainable because of its plantation way of landownership and production. In certain sense, we might suggest the sugar produced in the Ommelanden of Batavia could be the most globalized sugar in the early modern world because of its global market and its absorption of Chinese, Dutch and Javanese influences.

Honestly, before the rich sources of the second half of the eighteenth century are explored, I am on a proper position to conclude the history of the Sino-Dutch sugar frontiers in early modern Asia. But by focusing on the emergence and expansion stages of the plantation system, an preliminary conclusion of the nature of that frontier society can be drawn. Indeed, that society was singular as it differed from both the experience in China and in the West Indies, but that singularity was not because the sugar frontiers were isolated from the rest of the world. Instead, it was rather because the sugar frontiers were so much connected with the rest of the world. These connections introduced different traditions from China, Europe and Java, and made them converge in the Dutch East Indies. The consequence of that convergence was the construction of the unique Sino-Dutch sugar frontiers in early modern time. In other words, global connections created a unique rural society in a remote frontier area in early modern Asia.

Appendices

Appendix 1: A full list of 116 sugar mills in the Ommelanden in 1696.

(ANRI, College van Heemraden 7: 34B-53A, resoluties, 1696-1702, 15 Sep. 1696)

Location	Sugar millers	Landowners	Number of sugar mills	How longthe mills had been built
Sugar mills listed below are located in the eastern part of the Ommelanden				
East and west sides of Bekasi	Khouboeijko (Chinese); Queijsoecko (Chinese); Kanthieuwko (Chinese)	Srancis de Cara	1	5 years
	Tswabeeko (Chinese); Limoenko (Chinese)	Hanibal van Quemuij	2	1.5 years
	Quejouko (Chinese); Quelancko (Chinese)	Hanibal van Quemuij	2	1.5 years
East and west sides of Marunda	Bepeeko (Chinese)	Hanibal van Quemuij	1	3 years
	Hanibal van Quemuij; Bartel van Bougis	Hanibal van Quemuij	1	1 year
	Khoeficko (Chinese)	Hanibal van Quemuij	2	1.5 years
	Juff. (the widow of Hendrik Labij)	Hanibal van Quemuij	1	1.5 years
	Sie Joeko (Chinese)	Hanibal van Quemuij	1	4 years, and purchased by him on 29 August, 1696
The east side of Tsiakong	Oeijkongko (Chinese); Tsiamhiongko (Chinese)	the Company's land (in bezit and aan g'tacxeert by the widow of Jan Ruijs)	2	2 years
	Quetiancko (Chinese)	the Company's land (in bezit and aan g'tacxeert by the widow of Jan Ruijs)	2	2 years
	Tankimko	the Company's land	2	1.5 years

	(Chinese); Tankako (Chinese)	(in bezit and aan g'tacxeert by the widow of Jan Ruijs)		
Between Marunda and seaside	Quetsoenqua (Chinese)	the Company's land	1	3 years
	Bepeeko (Chinese)	the Widow of Captain Harman Egberts	1	3 years
	Twoa-Oeijqua (Chinese)	den moor Cheudelebe	1	2.5 years
Between the River Lago and the Creek Trusang	Tswa-Oeijqua (Chinese)	Hendrick Theums.(Mardijker)	1	6 years
Between Trusang and Toegoe	Tsan Moeijko (Chinese)	Quekoemqua(the old Chinese Captain)	2	one for 8 years, and the other one for 5 years
	Khunghionko (Chinese)	Quekoemqua(the old Chinese Captain)	2	8 years
	Oeijkonko (Chinese)	Vaardrigh Silij van Japara(Javanese)	2	6 years
	Khung-wancko (Chinese)	Cappa Coelop(Javanese)	1	1 year
	Thehongko (Chinese); Quetiamqua (Chinese)	Pieter and Elisabeth Anthonijsz	2	4 years
East and west sides of Sontar	Ongwako (Chinese)	Juss. the widow of Bushoff	1	2 years
	Adriaan Tomas.	Adriaan Tomas.	1	3 years
	Tanquansaij (Chinese)	David Schouten (grave digger)	1	1.5 years
	Anthonij Pieters.	Anthonij Pieters. Soolmans	1	10 year

	Soolmans			
	Abraham Alvis	Abraham Alvis	1	20 years
Subtotal			**35**	
Sugar mills below are located in the southern part of the Ommelanden (around the Ciliwung River)				
East and west sides of Ciliwung	Domingo Diogo (Mardijker)	Domingo Diogo(Mardijker)	2	one for 10 years, and the other one for 3 years
	Imsielauw (Chinese)	Joan van Hoorn(the Director General)	2	6 years
	Andries Poleman	Andries Poleman	1	2 years
	Ongkeko (Chinese)	Andries Poleman	1	3 years
	Tanlianko (Chinese)	Tanlianko (Chinese)	3	5 years
	Li_Tsanko (Chinese)	Dain Matara (Makassarese)	1	some time ago
	Baskaan Pieris	Dain Matara (Makassarese)	1	3 years
	Tankioko(Chinese)	Dain Matara (Makassarese)	1	2 years
	Oeij Sonko (Chinese)	Carel Jan. (the Captain of Mardijkers)	1	3 years
	Tsia-Kianko (Chinese)	Carel Jan. (the Captain of Mardijkers)	1	3 years
	Soeijkiuko (Chinese)	Jacob Corpus	3	3 years, and recently purchased by him
	Nieinko (Chinese)	the Company's land	1	6 years, and purchased by him on 4 April 1696

	Teo-Wangko (Chinese)	Joan van Hoorn (the Director General)	2	7 years
	Teo-Inko (Chinese)	Joan van Hoorn (the Director General)	1	7 years
	Tankeko (Chinese); Koincko (Chinese)	Joan van Hoorn (the Director General)	1	2years
	Ongheeko (Chinese); Oeij-Iko (Chinese)	Paulis Salvadoor	1	1 year
	Khouteeko (Chinese)	Joan van Hoorn (the Director General)	2	6 years
	Tankioko (Chinese)	the Company's land (in bezit and aan g'tacxeert by Captain Anthonij Adriaans)	1	2 years, and purchased by him on 2 July 1696
	Paul de Costa (Mardijker)	Paul de Costa (Mardijker)	1	purchased by him 8 years ago
	Limjacko of Limkeencqua (the Chinese Captain)	Joan van Hoorn (the Director General)	2	3 years
	Loklok (Chinese)	Cornelis Chastelijn	1	30 years
	Tanliancko (Chinese)	Cornelis Chastelijn	1	15-20 years
West side of Ciliwung	Anthonij Adriaans (the Captain of Mardijker)	Anthonij Adriaans (the Captain of Mardijker)	2	one for 18 years, and the other one for 16 years
	Oeijbiaucko (Chinese); Niaij Quaheencqua (Chinese); Goutincko (Chinese) etc.	Diogo Mirando (Mardijker)	3	3.5 years
	Quakhooko	Tanliancko (Chinese)	1	1 year

	(Chinese)			
	Oeijtsousia (Chinese)	Carel Jan. (the Captain of Mardijker)	2	one for 6 years, and the other one for 3 years
	Aria Marta Nata	Christoffel Leeser (burger)	2	one for 18 years, and the other one for 2.5 years
	Joseph Thomas. (Mardijker)	Joseph Thomas. (Mardijker)	2	one for 5 years, and the other one almost finished
	Oeij-Sioncqua (Chinese)	Simoa Rodrigo	1	purchased by him 5.5 years ago
	Tswa-Kiongko (Chinese)	Gentiev Moedelij	1	6 year, and purchased by him 2 years ago
	Poutsieko (Chinese); Tanketsie (Chinese)	Ongkuntsie (female)	1	4 years
	Khouteeko (Chinese)	Cornelis Chastelijn	1	1.5 years
Subtotal			**47**	
Sugar mills below are located in the western part of the Ommelanden				
East side of Grocot	Susanna (the wife of Jacob Dominicus)	Susanna (the wife of Jacob Dominicus)	1	2.5 years
East and west sides of Grogol	Willem Nicolaas (Mardijker)	Willem Nicolaas (Mardijker)	1	3 years
	Iaptsauko (Chinese); Oeijlimko (Chinese)	Juff. (the widow of Hendrik Labij)	2	1 year
	Jan Lambert de Radder	Jan Lambert de Radder	2	12 years
East and west sides of Passangrahan	Ganthiooko (Chinese); Ganwijko (Chinese)	Abdul Lamur Balijers	1	more than 15 years
	Ganhiaoko	Abdul Lamur Balijers	1	13 years

	(Chinese); Ganwijko (Chinese)			
	Limlianko (Chinese)	Made (Javanese Lieutenant)	1	purchased by him 2 years ago
	Lie-Gieko (Chinese)	Niaij Soucko (the mother of Lie-Gieko)	1	3 years
	Tsieuwping (Chinese)	Niaij Denok	1	3 years
	Tedjancko (Chinese)	Niaij Soucko	1	3 years
	Niaij Denok	Niaij Denok	1	1 year
	Sisaacko (Chinese)	Niaij Denok	1	3 years
	David Reguleth; Gouwkieko (Chinese)	Niaij Denok	2	11 March, 1695
	Tantsiongko (Chinese)	Wadon (Javanese woman married to Chilij Wigewa)	2	one for 2 years, and the other one for 1 year
	Goeijtsantse (the widow of Tehoeko (Chinese))	Franciscus de Sousa	2	16 years
	Tan-Uwko (Chinese)	the widow of Anthonij Sernando	1	1 year
	Poa-Kincko (Chinese)	Jacob Delange	1	1 year
	Gouwkoko (Chinese); Tanbocko (Chinese)	Hendrick Reguleth (burger)	2	one for 3 years and the other one for 2 years
	Litsanko (Chinese)	Michiel Salomons	1	1 year

	Goeijlocko (Chinese)	Ganthencqua (Chinese)	1	1 year
	Thetiongko (Chinese)	Ganthencqua (Chinese)	1	1 year
	Niaij Tanhiantse (the widow of Soucko)	Niaij Tanhiantse (the widow of Soucko)	3	24 years
	Niaij Tanhiantse (the widow of Soucko)	Niaij Tanhiantse (the widow of Soucko)	2	30 years
Oost and west sides of Tangerang	Tebeencko (Chinese)	Joan van Hoorn (the Director General)	1	3 years
	Landsicko (Chinese)	Domingo Marso	1	1 year
Subtotal			**34**	
Total			**116**	

Table 6. A full list of 116 sugar mills in the Ommelanden in 1696.

Appendix 2: The price of sugar (1636-1740)

Year	Price per picul of 125 pounds	Currency
1636[1]	5.5	rials
1642[2]	from 9 to 5.5	rials
1654[3]	from 5.5 to 8.5(first) and 6(second)	rials
1657[4]	6(first), 5(second), and 4(third)	bad rials of 48 stuivens
1660[5]	5(first) and 4(second)	bad rials of 48 stuivens
1662[6]	5.75(first) and 4.25(second) for Pittavin's watermill; 5(first) and 4(second) for the rest	bad rials of 48 stuivens
1663[7]	5.25 rijksdalders or 6.56 rials (first) and 3.4 rijksdaalders or 4.25 rials(second) for Pittavin's watermill; 5 rials(first) and 4 rials(second) for the rest	rijksdaalders and bad rials

[1] Coolhaas, Generale missiven, vol. 1, 570.
[2] NA, VOC 665: 26, Kopie-resoluties, 7 Feb. 1642.
[3] NA, VOC 677, Kopie-resoluties, 15 Dec. 1654.
[4] NA, VOC 677, Kopie-resoluties, 27 Jul. 1657.
[5] NA, VOC 678: 11, Kopie-resoluties, 3 Feb. 1660.
[6] NA, VOC 678: 110-115, Kopie-resoluties, 16 May. 1662.
[7] NA, VOC 678: 18, Kopie-resoluties, 9 Jan. 1663.

1705[1]	from 3 to 3.5(first)	rijksdaalders
1706[2]	4(first)	rijksdaalders
1710[3]	3	rijksdaalders
1711[4]	3.5(first) and 3(second)	rijksdaalders
1719[5]	from 3.5 to 4(first) and from 3 to 3.5(second)	rijksdaalders
1728[6]	4(first) and 3.5(second)	rijksdaalders
1734[7]	3(first) and 2.5(second)	rijksdaalders
1734[8]	3.25(first) and 2.75(second)	rijksdaalders
1738[9]	3.5(first) and 3(second)	rijksdaalders
1740[10]	3.75(first) and 3.5(second)	rijksdaalders

Table 7. The original price of sugar offered by the Company based on the different grades of sugar (1636-1740).

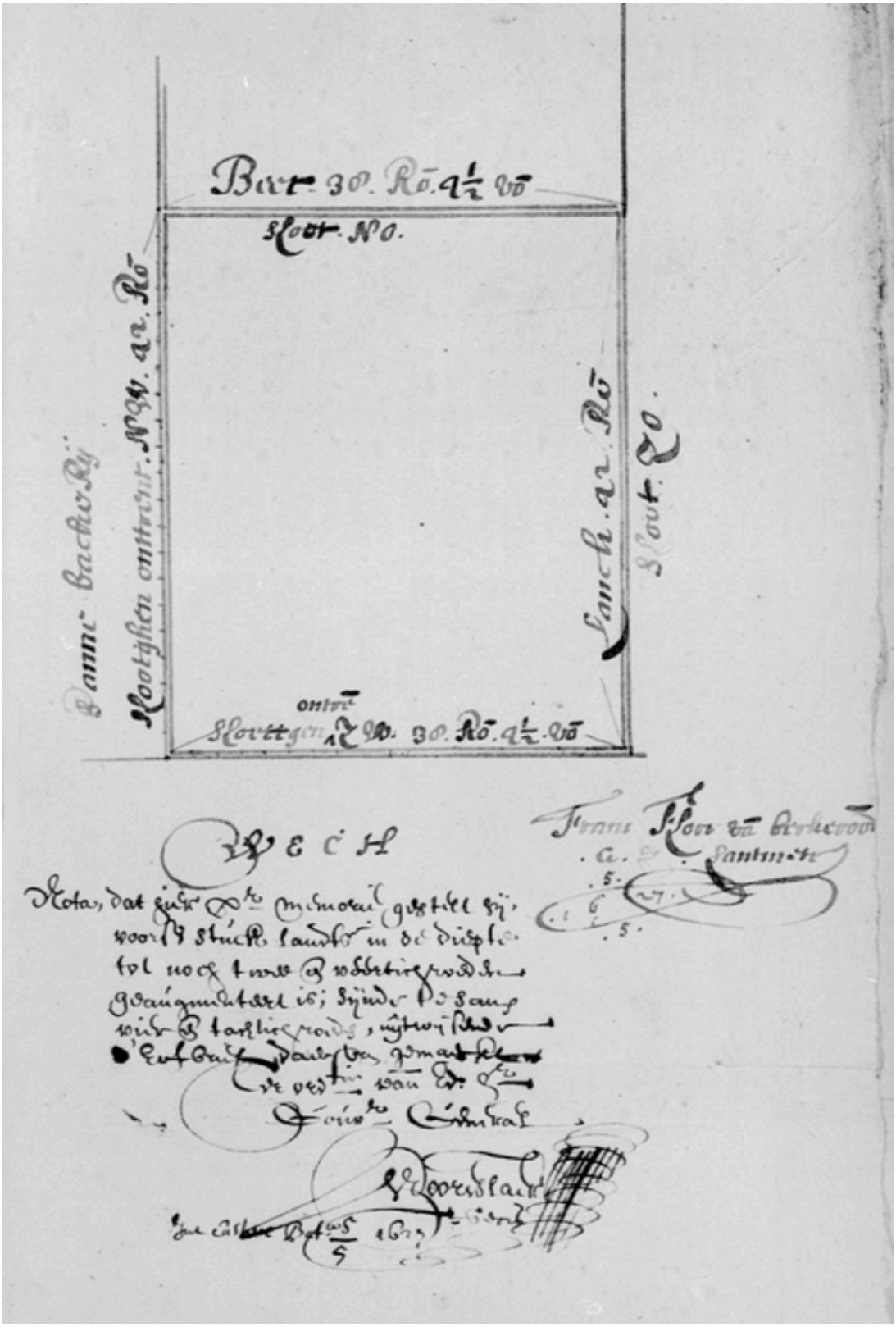
The average price of sugar (1636-1740)	
year	price (rijksdaalders per picul)
1636	5.50
1641	9.00
1642	5.50
1654	7.25
1657	4.00
1660	3.60
1662	3.80
1663	3.96
Average 1636-1663	**5.33**
1705	3.25
1706	3.75
1710	3.00
1711	3.25
1719	3.75
1728	3.75

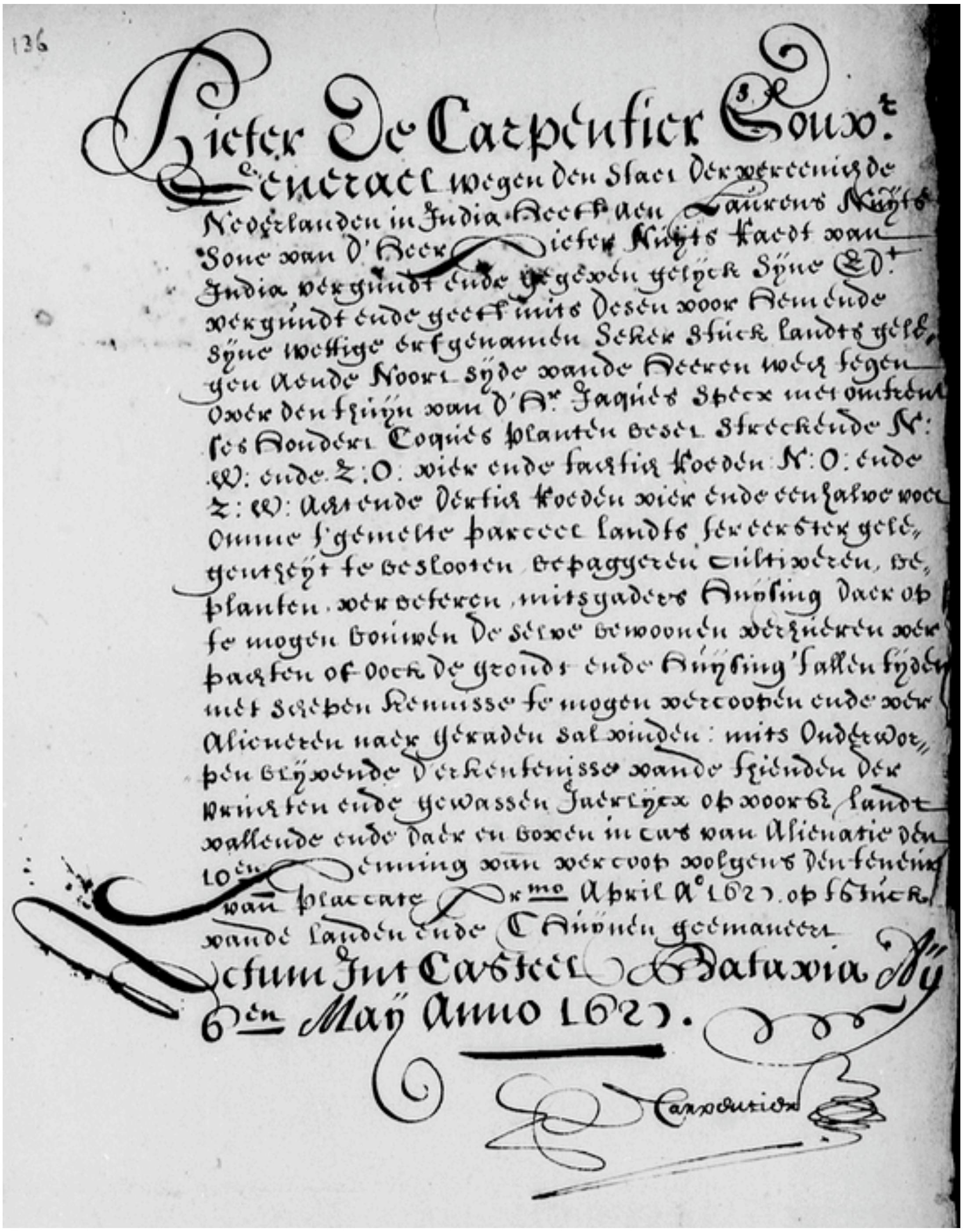
[1] NA, VOC 720: 635-637, Kopie-resoluties, 9 Oct. 1705.
[2] NA, VOC 722: 574-575, Kopie-resoluties, 5 Aug. 1706..
[3] De Jonge, De Opkomst van het Nederlandsch Gezag, 8, 163
[4] NA, VOC 727: 481, Kopie-resoluties, 3 Jul. 1711.
[5] NA, VOC 735: 708-710, Kopie-resoluties, 15 Aug. 1719
[6] NA, VOC 744: 447-450, Kopie-resoluties, 27 Jul. 1728.
[7] NA, VOC 754: 96-110, Kopie-resoluties, 2 Nov. 1734.
[8] NA, VOC 754: 122-130, Kopie-resoluties, 9 Nov. 1734.
[9] NA, VOC 762: 121-125, Kopie-resoluties, 9 Aug. 1738.
[10] NA, VOC 766: 66-69, Kopie-resoluties, 13 Sep. 1740.

1734	2.75
1734	3.00
1738	3.25
1740	3.62
Average 1705-1740	**3.34**

Table 8. The average price of sugar calculated, based on Table 7 (1636-1740).

Appendix 3: A land plan, dated 1627, in the family archive of Huydecooper. (RAU, Huydecooper, 621 (1621-1638))(available online: http://www.archieven.nl/nl/zoeken?miadt=39&mizig=210&miview=inv2&milang=nl&micols=1&mires=0&micode=67&mip2=621, visited 23 December 2016)




136

Pieter de Carpentier Gouvr:
Generael wegen den Staet der vereenichde
Nederlanden in India heeft aen Laurens Ruyts
Sone van d'heer Pieter Ruyts Raedt van
India vergundt ende gegeven gelyck syne Ed.
vergundt ende geeft mits desen voor hem ende
syne wettige erfgenamen seker stuck landts gele-
gen aende Noort syde vande Reviere west tegen
over den thuyn van d'hr Jaques Specx met omtrent
ses hondert Coques planten beset streckende N:
W: ende Z:O: vier ende tachtich roeden N:O: ende
Z:W: acht ende dertich roeden vier ende een halve voet
omme t'gemelte parceel landts ter eener plaetse gele-
gentheyt te besloten bepaggeren cultiveren, be-
planten, verbeteren, mitsgaders huysing daer op
te mogen bouwen de selve bewoonen verhueren ver-
pachten of ook de grondt ende huysing t'sallen tyde
met schepen kennisse te mogen vercoopen ende ver-
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pen blyvende d'erkentenisse vande tienden der
vruchten ende gewassen jaerlycx op voors. landt
vallende ende daer en boven in cas van alienatie den
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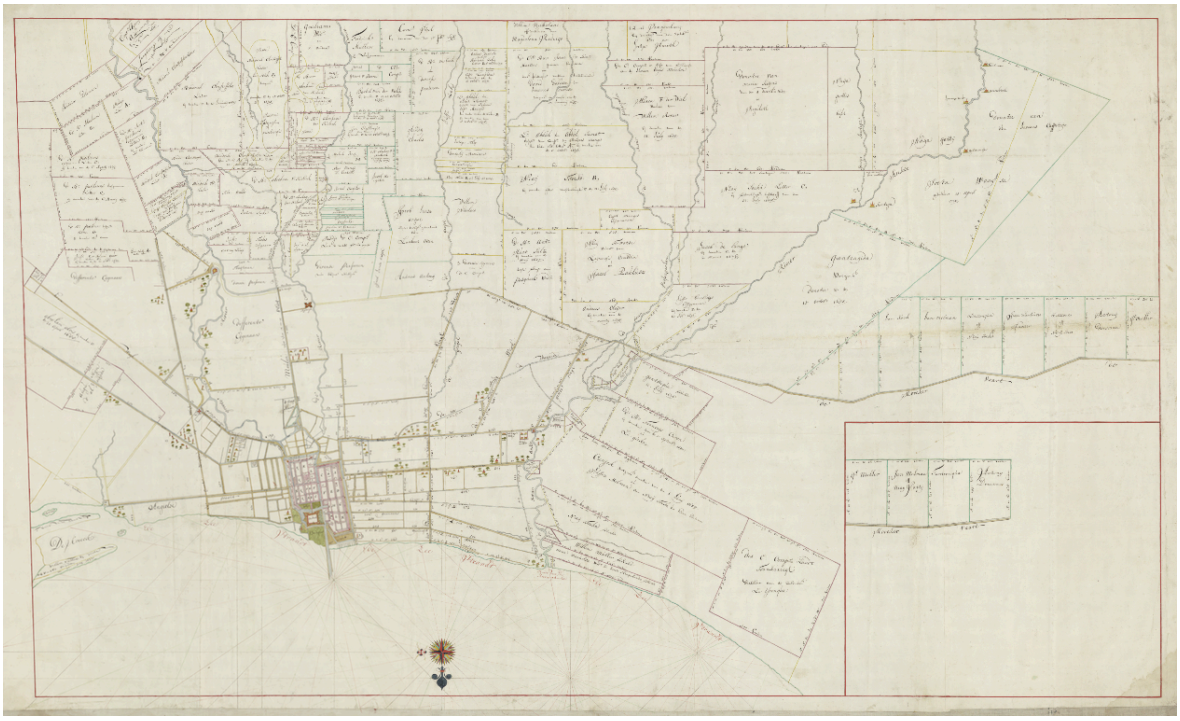
van placcate [illegible] Aprill Ao 1627 op t'stuck
vande landen ende thuynen geemaneert
Actum int Casteel Batavia ady
6en May anno 1627.

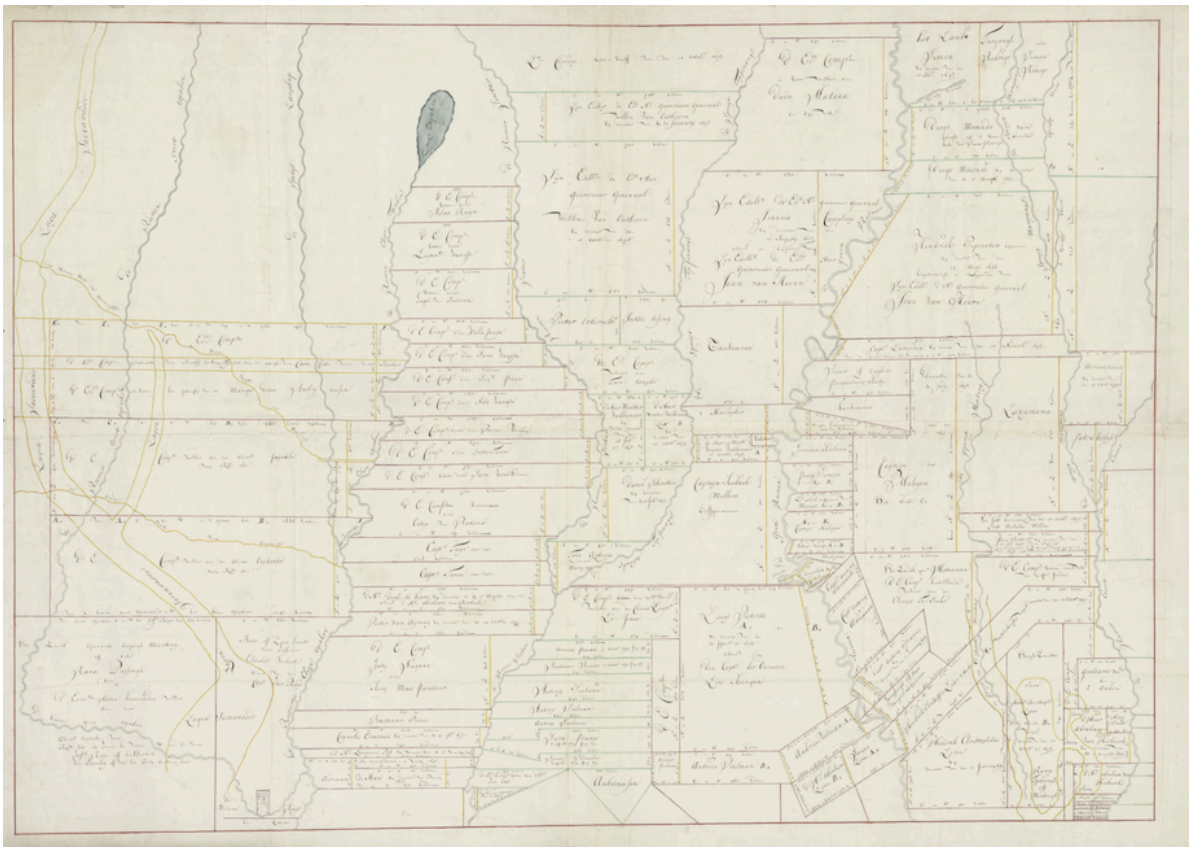
Carpentier

Appendix 4: The four cadastral maps collectively covered the major part of the Ommelanden which had then been subject to land reclamation. They date around the end of 1706. (Nationaal Archief (NA), Den Haag, VEL 1184-1187)

VEL 1184 (Northeast)



VEL 1185 (Northwest)



VEL 1186 (Southeast)

VEL 1187 (Southwest)

Appendix 5: The Estate of Wouter Hendrix along the Tsiakong River. (Nationaal Archief (NA), Den Haag, VEL 1244)

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Kopie-resoluties van gouverneur-generaal en raden: 662, 663, 665, 676, 677,678, 679, 680, 683, 685, 720, 722,725, 726, 727, 735, 744, 754, 762, 766.

Overgekomen brieven en papieren uit Indië aan de Heren XVII en de kamer Amsterdam:1122, 1149, 1164, 1176, 1183, 1194, 1207, 1213, 1218, 1222, 1228.

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Landkaarten, plans, enz: 1184-1187; 1240-1245

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Net-resoluties, met hiaten: 5, 7, 13.

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(available online: http://www.archieven.nl/nl/zoeken?miadt=39&mizig=210&miview=inv2&milang=nl&micols=1&mires=0&micode=67&mip2=621, visited 23 December 2016)

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