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Weather, Harvests, and Taxes: A Chinese Revolt in Colonial Taiwan

Taiwan is now an overwhelmingly Chinese society in which indigenous Austronesian peoples comprise only 2 percent of the population, but 400 years ago, the island was inhabited by about 100,000 indigenous people and a relatively small number of Chinese sojourners who came to fish for mullet or to trade. The bellicose aboriginal warriors prohibited the Chinese who resided across the Taiwan Strait about 100 miles away from farming or hunting. To pursue business with China, the Dutch East India Company, or the VOC (*De Vereenigde Oost-Indische Compagnie*), subjugated the indigenous Taiwanese, turning Taiwan into an entrepôt from 1624 to 1662. Because the island's natives were engaged largely in hunting and small-scale farming, the Dutch enlisted more skillful and diligent Chinese migrants to cultivate Taiwan's abundance of fertile land, given the impracticality of importing Dutch farmers. Unlike the contemporary Africans who became forced laborers in the South American plantations, many Chinese farmers were eager to settle in Taiwan to escape China's famines and floods, as well as the conflicts that climaxed in 1644 when the Manchu crossed the Great Wall to end the Ming Dynasty and claim the Mandate of Heaven for the Qing Dynasty.[1]

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1 For the current indigenous population of Taiwan, see the website of Council of Indigenous Peoples, Taiwan. The population figure in the seventeenth century is cited from VOC 1183, 884, letter from Nicolaes Verburg to Carel Reniersz, Tayouan, October 25, 1651 (VOC herein refers to the VOC archive stored in the National Archive in The Hague, the first number being the inventory number, followed by the folio number). A survey conducted in 1650 found 68,657 indigenous people in 265 villages under the Company's rule; 50 other villages were not surveyed. See Leonard Blussé, Natalie Everts, and Evelien Frech (eds.), *The Formosan Encounter: Notes on Formosa's Aboriginal Society: A Selection of Documents from Dutch Archival*

To attract Chinese colonists, the Dutch disseminated placards in Chinese coastal cities, advertising tax exemptions for those willing to relocate to Taiwan. They also loaned oxen and capital to those who accepted the invitation and built a hospital to treat Chinese patients. More importantly, they bestowed property rights on the migrants and allowed their land titles to be inherited, recording these rights to land on maps and a land register to enable any disputes to be resolved legally. A three-tiered court system and an elementary police bureau were established to maintain order. In general, the VOC created an economic environment safe for investment.[2]

Without the military and legal support of the VOC, the local headhunters would have kept the Chinese out. When villagers of Mattauw set fire to Chinese farmers' crops, Batavia (the VOC's headquarter in Asia, now known as Jakarta) sent 400 soldiers to assist Taiwan Governor Hans Putmans in a punishing expedition to Mattauw in 1635 that laid waste to the entire village. When villagers of Favorlangh repeatedly chased away Chinese hunters, Governor Johan Van der Burch led two expeditions in 1637 and 1638 to Favorlangh to destroy their houses and rice storage barns. The Chinese must have felt reasonably secure under the Dutch protection; their numbers increased from around 3,000 in 1640 to 25,000 in 1662.[3]

Most of the farmers cultivated rice for local consumption and sugar for export to such markets as the Netherlands, Persia, and Japan. During the 1630s, the profit margin of sugar from Taiwan and China to the Netherlands was between 262 percent and 423 percent. Although the introduction of Chinese settlers to Taiwan was

Sources (Taipei, 2006), II, 289–297. The survey's original source is VOC 1176, 781–789, a list of the villages, houses, and people in Formosa, May 1, 1650. Frederic Wakeman, *The Fall of Imperial China* (New York, 1975), 79–82.

2 For the Dutch efforts to establish the Chinese settlement, see Tonio Andrade, *How Taiwan Became Chinese: Dutch, Spanish, and Han Colonization in the Seventeenth Century* (New York, 2008), 115–132; Pol Heyns (Han Jiabao), *Helan shidai Taiwan de jingji, tudi, yu shuiwu* (Economy, Land Rights and Taxation in Dutch Formosa), (Taipei, 2002), 57–58, 92–98; Yung-Ho Ts'ao, *Tai Wan Zao Qi Li Shi Yan Jiu* (Research on Taiwan's Early Period), (Taipei, 1991), 25–70.

3 VOC 1114, 11, letter from Hans Putmans to Camer Amsterdam, Tayouan, October 28, 1634; VOC (edited by Blussé, M. E. van Opstall, and Ts'ao, with Shu-sheng Chiang and Everts), *De Dagregisters van Het Kasteel Zeelandia, Taiwan 1629–1662* (The Hague, 1986), I, 200–201; Heyns, *Dutch Formosa*, 58. For details of these punishing expeditions, see Hsin-hui Chiu, *The Colonial 'Civilizing Process' in Dutch Formosa: 1624–1662* (Leiden, 2008), 39–42, 67–71. For the population of Chinese settlers, see Koo, "Sugar Production and Its Trade in Dutch Colonial Taiwan," presented at the conference "Sugar and Slavery towards a New World History," Tokyo, 2012.

highly profitable for the Dutch, the migrants, who were most likely from the poorest strata of Chinese society, did not fare so well, managing only to earn China's average GDP per capita in a normal year. Nonetheless, Andrade uses the term *co-colonization* to describe this outcome as a "win-win" situation for the Dutch and the Chinese in Taiwan. In 1649, Governor Nicolaes Verburg praised the Chinese as "the only bees on Formosa that give honey, and without whom the Company would not survive here."[4]

Europeans also cooperated with the overseas Chinese to establish colonies in other Southeast Asian locations with a large indigenous population—for instance, the Spanish Philippines and Dutch Java. This mutually beneficial cooperation was not, however, in perfect harmony. Occasional uprisings against Europeans always led to massacres of Chinese—20,000 of them in the Philippines twice (1603 and 1609) and 10,000 in 1740 Java. The cause of many such tragic conflicts remains mysterious.

The Chinese revolt of 1652 in Dutch Taiwan, the main subject of this article, certainly benefits from a perspective born of recent studies. Parker's work on the global crisis of the seventeenth century points to three scenarios within which revolts often erupted—a failed harvest, the forced billeting of soldiers, and an increased tax burden. The finding in this article serves as a confirmation regarding his first scenario.

The year before the revolt was unusually dry, leading to a disappointing sugar harvest, which was undoubtedly a strong contributing factor. But the complete story is much more complicated.[5]

4 For sugar's profit margin and farmers' per capita income, see Koo, "Sugar Production." VOC 1172, 472, letter from Verburg to Cornelis van der Lijn in Batavia, Tayouan, November 18, 1649, indirectly cited from *Dagregisters Zeelandia,* III, 97.

5 José Eugenio Borao, "The Massacre of 1603: Chinese Perception of the Spaniards in the Philippines," *Itinerario*, XXIII (1998), 22–39; Charles J. McCarthy, "Slaughter of Sangleys in 1639," *Philippine Studies*, XVIII (1970), 659–667; Blussé, "Batavia, 1619–1740: The Rise and Fall of a Chinese Colonial Town," *Journal of Southeast Asian Studies*, XII (1981), 159–178; Geoffrey Parker, "Crisis and Catastrophe: The Global Crisis of the Seventeenth Century Reconsidered," *American Historical Review*, CXIII (2008), 1053–1079; *idem*, *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century* (New Haven, 2013), 512–515. For a pioneering work on the relationship between climate and history, see the special issue, "Climate and History," *Journal of Interdisciplinary History*, X (1980), 583–858; for the Little Ice Age, which figures heavily in Parker's recent work, the special issue, "The Little Ice Age: Climate and History Reconsidered," *ibid.*, XLIV (2014), 299–377; for the seventeenth-century crisis in general, the special issue, "The Crisis of the Seventeenth Century: Interdisciplinary Perspectives," *ibid.*, XL (2009), 149–303.

THE REVOLT Only three years after praising the Chinese for their industriousness, Verburg in the afternoon of September 7, 1652, learned that Gougua Faij-it (Guo Huai Yi), a Chinese farmer, was plotting a revolt against the Dutch. Forewarned, the Dutch made rapid preparations for conflict. In two major battles within the next five days, a Dutch brigade of 120 soldiers equipped with muskets and accompanied by 600 native auxiliaries stood against 5,000 Chinese revolutionaries—about one-third of the Chinese population on the island. Although the Chinese greatly outnumbered the Dutch, their modest weaponry—bamboo staffs, swords, and knives—failed to wound even a single VOC soldier; the Chinese casualties numbered 2,500 to 4,000. On September 19, the victorious Dutch proclaimed a formal cease-fire.[6]

While attacking the hamlet of Provintia (in present-day Tainan), the revolutionaries were heard to shout, "Kill, kill the Dutch dogs!" The reason for their bitterness is unclear. Unfortunately, no contemporary Chinese sources analyze this revolt. Koo's research shows that, during this period, Chinese migrants to Taiwan came from the most underprivileged 2 to 6 percent of the population in Fujian Province. Even in 1880s, the Chinese literacy rate was low—30 to 45 percent for males and 2 to 10 percent for females. Since economic status is often a good indicator of literacy, the literacy rate of Taiwan's mid-seventeenth-century Chinese revolutionaries was probably not much above zero, making the absence of Chinese sources understandable.[7]

Huber and Heyns turned to the VOC sources to offer two possible causes of the revolt: (1) the abuse of the Chinese by the VOC's soldiers and (2) the financial crisis resulting from the auction of the village leasehold. This article proposes instead that this farmers'

6 We are hesitant to use the term *Dutch soldiers* because 40% of the sailors and 60% of the soldiers employed by the VOC came predominantly from German states. See Femme Gaastra, *The Dutch East India Company* (Zutphen, 2003), 81. VOC 1194, 121r–127r, letter from Verburg to Reniersz in Batavia, Tayouan, October 30, 1652. See 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 Fujian Province in the 17th and 18th Centuries* (Leiden, 1990), 291–296, for an excellent English translation of the relevant sources.

7 VOC 1183, 904r, letter from Verburg to Reniersz in Batavia, Tayouan, November 21, 1651; Shu-shen Chiang, "He Lan Shi Qi Tai Wan De Han Ren Ren Kou Bian Qian (Population Changes in Dutch Colonial Taiwan)," in *Ma Zu Shen Yang Guo Ji Xiao Shu Yan Tao Hui Lun Wen Ji* (International Conference on Belief in Matsu held by Beigan Chao-Tien Temple) (Beigan, 1997), 14–23. Koo, "Sugar Production"; Evelyn Rawski, *Education and Popular Literacy in Qing China* (Ann Arbor, 1979), 23.

revolt was due largely to a bad sugar season. One year before the revolt, a few sugar producers, including Faij-it, Sinco Swartenbaert, and Sako, had borrowed heavily from the Dutch to finance sugar production and could barely pay their debts when the next harvest proved poor. Sugar farmers were also incited to revolt because of an obligatory poll tax that did not take into account the depressed sugar season.[8]

At the same time, on the other side of the globe in Brazil, Portuguese sugar planters heavily indebted to the Dutch West Indian Company also led a revolt against their Dutch rulers (1645–1654). In both cases, loans originally intended to stimulate the sugar industry rendered debtors insolvent and backfired on the creditors. How cogent are the arguments of Huber and Heyns?[9]

THE POLL TAX AND THE VILLAGE LEASEHOLD SYSTEM Huber blames the revolt on VOC soldiers who abused the Chinese when checking their poll-tax receipts. To meet the Company's expenses in Taiwan at the end of 1639, a poll tax of 0.25 real per month was proposed and formally introduced on September 1, 1640. The rate was considered reasonable at the time since the daily wage of a local artisan was 1/8 real, and only a small amount of four to five reals would be sent to a farmer's wife and children in China. No later than 1654, according to a report by Verburg, the tax rate rose to seven double stuijvers—a 1/6 increase over the original six double stuijvers, or 0.25 real. If we consider the poll tax as an income tax, the rate before the revolt would have been about 9.7 percent.[10]

To prevent tax evasion, the Company sent soldiers to examine the receipts of Chinese residents. Taking advantage of the situation, soldiers started to extort the Chinese that they met on

8 Huber, "Kuo Huai-I," 265–296; Heyns, *Dutch Formosa*, 170–172; Andrade, *How Taiwan Became Chinese*, 323.

9 Stuart Schwartz, "A Commonwealth within Itself: The Early Brazilian Sugar Industry, 1550–1670," in *idem* (ed.), *Tropical Babylons: Sugar and the Making of the Atlantic World, 1450–1680* (Chapel Hill, 2003), 169.

10 VOC 1131, 304–305, report from Nicolaes Couckebacker to Anthonio van Diemen and the councilors of India, in the fluijtschip de Rijp sailing to Batavia, December 8, 1639. *Dagregisters Zeelandia*, I, 500; VOC, 1206, 233r, a short report regarding the position and opportunity of Formosa by Verburg, Batavia, March 10, 1654. Heyns, *Dutch Formosa,* 143–145, derives this tax rate from an estimate of twenty-four working days in a month, given that Sundays and religious holidays were nonworking days.

village roads, threatening to bring them into headquarters for interrogation. Out of fear, even innocent victims would pay soldiers a few goats to avoid the ordeal. After receiving repeated complaints, the Dutch announced in March 1646 that the Chinese could be detained only by authorized persons with specific credentials. But this measure did not resolve the issue. In October 1647, to stop soldiers from preying upon (*jagen*) the Chinese, Chinese cabessas (headmen) proposed the payment of a fixed poll tax equivalent to the amount that 8,000 people would pay each month, thus relieving individuals of the strain. The VOC officials refused the deal probably because they thought that the proposed revenue was unsatisfactory. In November of the same year, the Dutch had managed to collect a poll tax from 10,000 people. In October 1651, one year before the revolt, Chinese representatives appealed again for relief from soldiers' abuse—particularly forced entry into Chinese houses when the inhabitants were asleep or away—under the pretext of seeking tax receipts; thefts and/or beatings at the hands of soldiers were not uncommon.[11]

Strong evidence in support of Huber's argument that such accumulated injustices inevitably forced a large group of disgruntled farmers to resist their oppressors is that after the revolt, starting in 1653, the Dutch conferred the responsibility for collecting the poll tax on the Chinese—a change that was intended to ease tension between the Chinese and the Dutch. Heyns, however, speculates that Faij-it and the other leaders of the rebellion were heavily indebted entrepreneurs who had bid too aggressively in village-leasehold auctions and could not make good on what they owed, and that their predicament actually resulted from the VOC policy. In December 1642, for example, the Dutch, always suspicious that the Chinese were inciting Taiwan's natives against them, expelled all of the Chinese living in any native villages except those in which the VOC had resident officers. From that point onward, Chinese traders departing on junks or sampans to trade with the indigenous Taiwanese had to purchase permits in advance and had to stay overnight on their vessels rather than in the village.

11 *Dagregisters Zeelandia*, II, 478–479, 600; VOC 1169, 400, letter from Pieter Anthonissen Overtwater to van der Lijn in Batavia, Tayouan, January 9, 1648, cited in Chiang, "Population Changes," 17; *Dagregisters Zeelandia*, III, 271.

The monthly fee for a trading permit was 1 real for a sampan, and 10 realsfor a junk. The annual sales of trading permits amounted to 100 reals.[12]

In 1644, the Dutch devised an ingenious mechanism that further complicated trade, the village-leasehold system. Instead of allowing any Chinese to trade in a village, the Dutch began auctioning annual monopoly trading rights to the highest bidder. The auction of May 1, 1644, raised 2,140 reals for the Company, more than twenty-one times the revenue received the year before. The auction winner had to pay half of his bid immediately and the remaining half a year later when the leasehold expired.[13]

The Chinese participated enthusiastically in the bidding for monopoly trading rights. In April 1650, auction revenue reached 61,405 reals, about one-and-one-half times that of the previous year (See Figure 1). The leaseholders were interested mainly in procuring deer products from village hunters, selling venison to Chinese markets and selling deerskins to the VOC for export to Japan. Unexpectedly, one month after the 1650 auction, the price of venison in China plummeted from 20 to 22 reals to 10 to 12 reals per picul (1 picul equals 125 lbs.). To lighten the burden on leaseholders, the Dutch changed the export tax rate on venison back from 6 to 4 reals per picul after having raised it one month earlier to ensure an ample supply, and a low cost, of venison in Taiwan. The price of venison in China remained low at 10 reals per picul for an entire year. At the end of June 1651, two months after the deadline for the second half of the bids was due, the Dutch decided to discount the bid money by 20 percent because leaseholders were still having difficulties making their payments, but many

12 VOC 1197, 788v, letter from Cornelis Caesar to Joan Maetsuijcker, Tayouan, October 24, 1653; Ts'ao, "Taiwan as an Entrepôt in East Asia in the Seventeenth Century," *Itinerario*, XXI (1997), 94–114; VOC 1141, 466–467, Tayouan's resolution, December 18, 1642; VOC 868, 377, instruction of van Diemen to Francois Caron, Batavia, July 4, 1644.

13 The Company used the descending-price auction, also known as the Dutch auction. See Ji Qi Guang, "Kang Xi Zhong Zhu Luo Xian Zhi Xian Ji Qi Guang Fu Yi Er Shi Si Nian Xiang Shui Wen (Reconsideration of Tax Returns in the Past Twenty-Five Years by County Magistrate Ji Qi Guang in Kangxi Era)," in *Fu Jian Tong Zhi Tai Wan Fu* (Gazetteer of Taiwan, Fujian), reprinted (Taipei, 1960), 164–169. VOC 1148, 259r, letter from Caron to Anthonio van Dieman in Batavia, Tayouan, October 25, 1644.

Fig. 1 Sales of Village-Leasehold Rights (in Reals)

NOTES (1) The revenue from Lamey Island, which became almost uninhabited after the Dutch massacred around 300 Lameyans in 1636, moving survivors to Taiwan and Batavia, is not included because of the different nature of its leasehold (see Yung-Ho Ts'ao and Leonard Blussé, "Disappearance of Lameyans: To Recover a Lost Page in Taiwan History," in *Research on Taiwan History in the Early Period: The Sequel* [Taipei, 2000], 185–237). Unlike leaseholders of other villages, where mainly trade in deer products was at stake, the leaseholder of Lamey Island reclaimed land. (2) Fishing rights are excluded except for those during the years 1652 and 1653, because no detailed records are available for these two years to distinguish fishing rights from other trading rights.

SOURCES 1644: VOC 1148,259, letter from Caron to van Dieman in Batavia, Tayouan, October 25, 1644; 1649: VOC 1171,160v, advice by the upper-merchant Gabriel Happart in Formosa Council, Tayouan, November 4, 1649, National Archive, The Hague; 1652: *Generale Missiven van Gouverneurs-Generaal en Raden aan Heren XVII der Vereenigde Oostindische Compagnie* (edited by W. Ph. Coolhaas) (The Hague, 1964), II, 607; 1653: *Generale Missiven*, II, 704–705. For all other years, see Nakamura Takashi, "He Lan Tong Zhi Xia De Tai Wan Nei Di Zhu Shui (Taxes in Dutch Colonial Taiwan)," in *He Lan Shi Dai Tai Wan Shi Yan Jiu* (Research on Taiwanese History under the Dutch Rule) (Taipei, 1997), I, 282–283, Chinese translation by Mi-cha Wu and Ang Kaim. His original sources are *Dagregisters Zeelandia* of various years.

leaseholders still could not pay their debts and thus faced time in jail.[14]

Heyns argues that Faij-it and the other leaders of the revolt were bankrupt leaseholders who wanted to nullify their debts by eliminating creditors. We find that conclusion questionable. When Faij-it and other sugar producers approached the Dutch to ask for a pepper loan in October 1651, the Dutch assented, explicitly stating that he and the other borrowers were all trustworthy (*geloofwaerdige*). If Faij-it had been a bankrupt leaseholder, he probably would have been in prison by October. Moreover, the Dutch would hardly have been willing to grant new loans to people who had previously defaulted.

Contra the explanations advanced by Huber and Heyns, we propose that Faij-it and his confederates were prompted to revolt in 1652 because of an inability to repay a pepper loan of 1651 that had been meant to finance the upcoming sugar production. In return, debtors had been supposed to deliver sugar in 1652. The poor sugar season, however, caused many debtors to default in that year. Probably after witnessing the consequences of defaulting, and refusing to be imprisoned, Faij-it led the farmers in revolt.

As Huber maintained, farmers joined the revolt willingly because of their long-brewing bitterness about harsh treatments at the hands of the Company's soldiers, but they had endured these indignities since 1640 when the poll tax was first collected. What made it suddenly intolerable in 1652 was the bad sugar season that made the poll tax unaffordable.

PEPPER LOANS Sugar production was a labor-intensive venture. In 1650, Verburg wrote to Batavia that because the mills were short of hands at harvest time, part of the sugar-cane fields could not be reaped, leaving less sugar for the VOC's overseas trade. To remedy the situation, the VOC provided sugar producers with cash or

14 VOC 1176, 823r, Tayouan's resolution, May 27, 1650; *Dagregisters Zeelandia* III, 118, 130; Heyns, *Dutch Formosa*, 169. *Generale Missiven*, II, December 19, 1651, 528; *Dagregisters Zeelandia*, III, 220; VOC 1183, 750, Tayouan's resolution, June 28, 1651. The drop in the price of venison might be a sign that the VOC's efforts to conserve Taiwan's deer started to take effect. Despite the unavailability of records that enumerate the amount of venison exported by Chinese merchants, we know the quantities of deerskins exported by the VOC, which showed a 20% annual growth from 1649 to 1651. See Koo, "Deer Hunting," 185–203. The quantity of venison exported probably grew in the same manner. If the demand for venison in China was inelastic, an increase in venison supplied could cause a sharp drop in price and a decrease in venison's sales revenue.

Table 1 The VOC's Loans to Sugar Producers

	CABESSAS			FARMERS			
	PEOPLE	PEPPER PER PERSON (PICUL)	REALS PER PERSON	PEOPLE	PEPPER PER PERSON (PICUL)	REALS PER PERSON	TOTAL LOAN (REALS)
1646	3						7,792
1650	10	200			?		?
1651.10	8	200	2,800	11	75	1,050	33,950
1653.12							20,429
1655.10						1,140	?
1658.01							7,000

SOURCES Sweers Collection 9,155, National Archive, The Hague (as cited in Pol Heyns [Han Jiabao], *Helan shidai Taiwan de jingji, tudi, yu shuiwu* [Economy, Land Rights, and Taxation in Dutch Formosa] [Taipei, 2002], 106); VOC 1182, 182, 189, resolutions of Verstegen etc., October 17 and November 2, 1651; VOC 1182, 321, daily notes of the events on the trip from Batavia to Tokin, Tayouan, and Quinam by Verstegen, October 17, 1651; VOC 1183, 557r, letter from Verburg to van der Lijn in Batavia, Tayouan, December 20, 1650; VOC 1206, 154v, letter from Caesar to Maetsuijkcer in Batavia, Tayouan, February 26, 1654; VOC 1228, 523, Tayouan's resolution, January 14, 1658, National Archive, The Hague; *Dagregisters Zeelandia*, III, 590.

commodities to help in the recruitment of sufficient labor, with the expectation that debtors would deliver sugar to the Company to repay their loans. Table 1 lists these loans. According to Taiwan Governor Pieter Overtwater, sugar cane was planted between December and April of the following year and harvested about a year later for processing. Table 1 shows that sugar producers always sought loans between October and January in preparation for the harvest.[15]

In 1650 and 1651, pepper loans were offered in place of cash loans. As witnessed by Marco Polo in the thirteenth century, China had a long history of importing pepper from South and Southeast Asia. When the Dutch occupied Taiwan, pepper was delivered to Taiwan for the VOC's China trade. In 1637, the VOC was short of cash and had to use pepper to trade for Chinese silk. During the 1640s, pepper contributed 50 to 70 percent of the VOC's trade profit in Taiwan. Presumably, after receiving pepper

15 VOC 1176, 936, letter from Verburg to van der Lijn in Batavia, Tayouan, October 31, 1650; VOC 1164, 373v, letter from Overtwater to van der Lijn in Batavia, Tayouan, September 24, 1647.

from the VOC, sugar producers could easily have disposed of it in China's market.[16]

The third entry in Table 1 is especially interesting in this context. One afternoon in mid-October in 1651, eight Chinese merchants and cabessas—all of them wealthy, trustworthy individuals (*alle geloofwaerdige en welgestelde lieden*)—appeared before the Formosa Council to request a pepper loan of 300 piculs per person. The Council decided to grant them only 200 piculs each. Additionally, eleven of the most important Chinese farmers received pepper loans of 75 piculs per person. Given that the value of the pepper was calculated according to the current market price of 14 reals per picul, the monetary value of the loan was 33,950 reals—14×([8×200]+[11×75])—which the debtors were expected to repay with sugar in the following year.[17]

Two of the eleven farmers who received pepper loans—Faij-it and Swartenbaert—became leaders of the revolt in 1652. Another farmer, named Sakoa, could well have been the "Sako" who was Swartenbaert's secretary (*schrijver*) and another participant in the revolt. If the conjecture that their failure to repay pepper loans led to the revolt is correct, the Dutch would certainly have refused to make similar loans, or at least cut the size of their loans, after the revolt.[18]

In fact, however, the Dutch were obliged (*genootdruckt*) to continue lending in 1653, because without the VOC's assistance, the Chinese would have been incapable of delivering sugar. Although a complete record of the loans is not available, the practice most likely continued on a yearly basis; as a case in point, a document of 1658 mentions a loan to have been granted again in accordance with the annual practice (*na jaarlyck gebruijck*). Nonetheless, Table 1 shows that the amount loaned decreased over time; the Dutch became more conservative when lending to Chinese sugar producers. Farmers, on average, received more in 1655 than in 1651

16 Ts'ao, "Pepper Trade in East Asia," *T'oung Pao*, LXVIII (1982), 221–247; Wei-chung Cheng, *War, Trade and Piracy in the China Seas, 1622–1683* (Leiden, 2013), 112, 147; Tsong-min Wu, "Cong Mao Yi Yu Chan Ye Fa Zhan Kan He Zhi Shi Qi Tai Wan Zhi Min Di Jing Ying Zhi Ji Xiao (An Evaluation of the VOC's Performance in Taiwan)," manuscript (Taipei, 2013), 11.

17 *Dagregisters Zeelandia*, III, 273–274; VOC 1182, 189, resolution of Willem Verstegen etc., November 2, 1651.

18 VOC 1194, 127v, letter from Verburg to Reniersz in Batavia (Jakarta), Tayouan, October 30, 1652.

only because the VOC expected a substantially larger sugar output in 1655 (40,000 piculs) than in 1651 (15,000 to 20,000 piculs). If the same expectation of output held for these two years, the VOC must have been much less lenient in 1655 than it was earlier.[19]

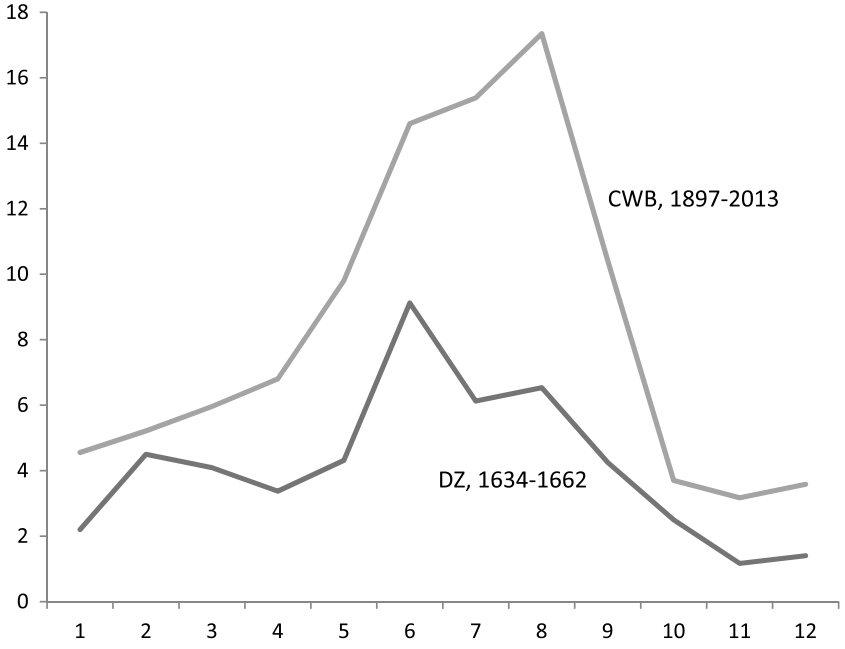
SOLVENT OR NOT? In October 1652, Verburg reported to Batavia that the pepper loans granted to Faij-it and others in the previous year amounted to 40,000 reals but that no more than half of it had been repaid. According to our calculations, the principal was 33,950 reals, and if the debt reached 40,000 reals a year later, the Dutch would have charged a yearly interest rate of 18 percent. Table 1 shows that in both 1650 and 1651, the Company granted cabessas 200 piculs of pepper per person, expecting the first loan to be repaid seven months later in 1651 at the end of the sugar season. In 1651, Taiwan witnessed a record-high output of sugar—35,000 piculs (compared to 5,300 piculs in 1649 and 12,000 piculs in 1650). The loans must have been duly repaid, since the debtors were described as "trustworthy" and were granted new pepper loans in 1651.[20]

The bumper sugar output in 1651 was harvested from cane cultivated in 1650. But what kind of year was 1651 for Taiwan's agriculture? Sugar cane needs an annual rainfall between 1,100 and 1,500 mm. According to the modern Tainan Weather Station, the station closest to where Faij-it and the Chinese farmers lived, the local rainfall has ranged from 899 to 3,149 mm during the last thirty years, with an average of 1,672 mm. With a good reservoir, due to this abundant rain, the area could save enough water to provide for stable sugar-cane cultivation in a dry year. Such was the practice during the last century when Tainan still had a large agricultural area. But in the seventeenth century, before modern facilities, an unusually dry year could threaten sugar cane's vegetative growth. From time to time, the VOC staff showed concerns about

19 VOC 1206, 154v, letter from Caesar to Maetsuijcker in Batavia, Tayouan, February 26, 1654; VOC 1228, 523, Tayouan's resolution, January 14, 1658; *Dagregisters Zeelandia*, III, 590; VOC 1183, 869, letter from Verburg to Reniersz in Batavia, Tayouan, October 25, 1651.

20 VOC 1194, 132v, letter from Verburg to Reniersz in Batavia, Tayouan, October 30, 1652; VOC 1183, 557r, letter from Verburg to van der Lijn in Batavia, Tayouan December 20, 1650; VOC 1183, 868, letter from Verburg to Reniersz in Batavia, Tayouan, October 25, 1651; Shaogang Cheng, *He Lan Ren Zai Fu Er Mo Sha* (De VOC en Formosa, 1624–1662: A Chinese Translation of Taiwan Related Materials in Generale Missiven) (Taipei, 2000), 312, 325, 336; Koo, "Sugar Production," 9.

Fig. 2 Monthly Raining Days in Tainan



NOTE The series DZ, 1634–1662, excludes months with incomplete weather records. Years 1629–1633 and 1637–1640 are excluded because the diaries in those years hardly mentioned weather conditions.

SOURCES (1) The data of DZ, 1634–1662, derive from weather records in *Dagregisters Zeelandia*. (2) The data of CWB, 1897–2013, derive from the Central Weather Bureau, Taiwan, available at http://southweb.cwb.gov.tw.

it: "If it does not rain in a short while, cane will wither." "There was a burst of heavy rain. It will do good to the newly planted cane." Hence, a dry year of 1651 would imply a poor harvest in 1652, the year of the revolt. The VOC's staff often kept weather records in diaries (*Dagregisters Zeelandia*) that provide some idea about contemporary climate conditions. For instance, May 1, 1650, began as a pleasant bright morning but then turned dark and rainy in the afternoon. To detect whether 1651 was unusually dry, we can review the entire series of diaries to count the days that saw rain in each year.[21]

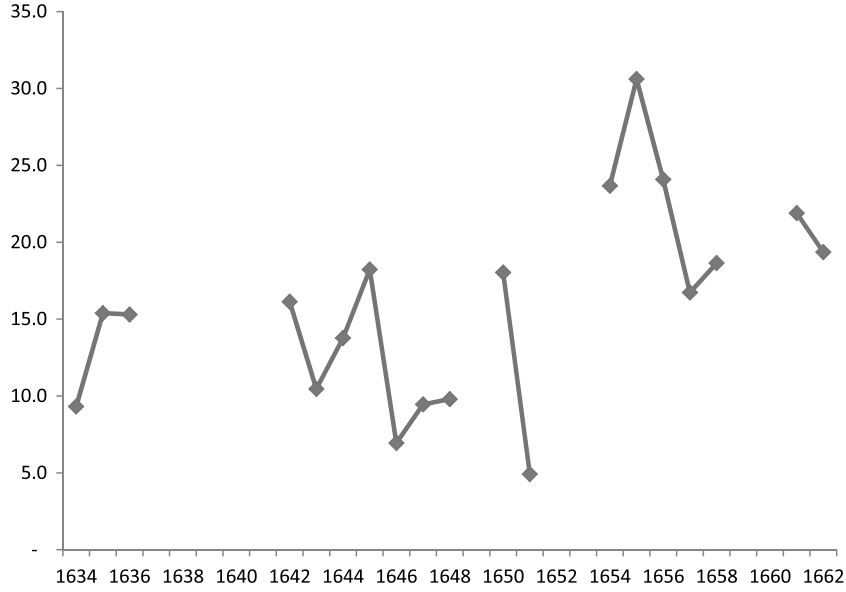
21 *Dagregisters Zeelandia*, II, 195, 495; III, 97, 125 195; IV, 44, 332, 418. For the rainfall requirement, see www.sugarcanecrops.com, and for Tainan's rainfall, see http://www.cwb.gov.tw/V7.

Figure 2 presents the average number of days with rain for each month, comparing the results with modern data from the Tainan Weather Station, though the qualitative description of weather conditions in the VOC's diaries can hardly match the technical detail of the modern records. The VOC reported fewer rainy days, especially in the summer, but both series—those in the diaries and in the modern compilations—show the summer as the predominantly wet season. The weather records of the *Dagregisters Zeelandia* prove to be sufficiently reliable for the purposes of this analysis.

Unfortunately, the diaries have missing years, and most years have missing months. In this case, the number of rainy days in a particular year depends on which diary has preserved the most days for that year. Hence, the percentage of rainy days for each year—that is, the ratio between the number of rainy days and the total number of days—is based on the diary with the best information for each year. Figure 3 presents the results for nineteen years. The average number of days per year preserved in diaries is 225, with a maximum of 365 and a minimum of 31. Year 1651, with 244 days preserved, stands out as the driest year in Dutch colonial Taiwan. Its percentage of raining days is 4.9 percent; the average percentage is 15.9 percent. Hence, the poor harvest of 1652 is completely understandable.

Ironically, in *Dagregisters Zeelandia*, the Dutch described the weather of that year in a positive manner, repeatedly praising the bright, sunny days. Note that to facilitate the maritime trade, Zeelandia Castle was built on a small island near the coast of Taiwan. The distance between the castle and the farmland in Taiwan was about 9 km. To reach the farmland, the Dutch had to cross the bay either by boat or, when the water was shallow at the shore, to wade to the beach. The difficulty of the trip probably limited Dutch visits to the mainland, thus leaving them ignorant of the stressful situation on the farms. Not until the autumn of 1651 did they become aware of the rice-crop failure and the famine in the villages. On October 5, 1651, the land surveyor Philip Daniel Maij reported that certain previously cultivated fields had become desolate after the Chinese had abandoned them. The survey results show that the area under cane cultivation was 1,380 morgen (1 morgen equals 8,516 m^2) in 1651, less than half of the area in 1650; the rice fields comprised 1,924 morgen, about 55 percent of the area in 1650. On October 25, 1651, the sugar harvest for the coming season was estimated to

Fig. 3 Yearly Percentage of Rainy Days



SOURCE The data derive from weather records in *Dagregisters Zeelandia*.

fall between 15,000 and 20,000 piculs. The new round of pepper loans granted to Faij-it and others was granted with these figures in mind.[22]

The high expectations for the sugar crop, however, were not realized; only 8,000 piculs were delivered in 1652. Though disappointing, this yield should have been sufficient to cover outstanding loans. The accounting book kept by the Japan Factory marked the arrival of two cargoes of powdered Formosan sugar in September 1652 with invoiced values varying from 6 to 7 reals per picul, the average being 6.81. Hence, the sugar delivered to

22 Meiyun Wu (ed.), *Shi Qi Shi Ji He Lan Ren Hui Zhi De Tai Wan Lao Di Tu* (Old Maps of Taiwan Drawn by the Dutch in the Seventeenth Century) (Taipei, 1997), I, 104. According to Google maps, the distance between Zeelandia Castle and Provintia, the site of the Chinese farmers' attack, was 8.6 km. Huber, "Kuo Huai-I," 272; *Dagregisters Zeelandia*, III, 269; Heyns, *Dutch Formosa*, 86. For farm areas, see VOC 1176, 791–792, specification of the sowed and planted crops in the Saccam's fields as measured in 1650, Tayouan. VOC 1182, 99, report of Verstegen on account of his trip to the north quarters, particularly Tonkin, Tayouan, and Quinam, Batavia, January 20, 1652; VOC 1183, 869r, letter from Verburg to Reniersz in Batavia, Tayouan, October 25, 1651.

the VOC in 1652 was worth about 54,480 reals (6.81×8,000), which exceeded the 40,000 reals in loans awaiting repayment.[23]

Why did the Dutch complain that less than half of the debt had been repaid? One possibility is that not all of the sugar producers received pepper loans in 1651, leaving the debtors an insufficient portion of sugar to erase their debts. The VOC's documents reveal a second possibility: Chinese debtors devised a cunning scheme to default on their pepper loans even though they had sufficient sugar to repay them. They arranged for the non-debtors to sell their sugar to the VOC for a cash payment, which they would disperse to the indebted farmers. In May 1651, Verburg had banned this practice, but Cornelis Caesar, the succeeding governor, had to post the edict again in July 1655, warning that offenders would be subject to corporal punishment.

In any event, not all of the sugar producers were likely to have borrowed from the Dutch. By all appearances, the cash value of the proportion of sugar produced by farmers with pepper loans, part of the 54,480 reals-worth of the sugar delivered to the VOC, exceeded the 40,000 reals of the loans, assuring the Chinese debtors' solvency. If so, why did Chinese debtors default? After using pepper loans to pay for various sugar-production expenses, the debtors had little money left to compensate their workers, especially with the poll tax looming. Default was a forced result.[24]

A DETAILED ACCOUNTING The Dutch were hardly apt to grant loans any larger than necessary to pay for sugar production. Recall that in 1651 when a cabessa requested a pepper loan of 300 piculs, he received only 200 piculs; in total, the pepper loans were worth 33,950 reals. The reduced loans would have been insufficient to cover all of the debtors' expenses, but we use them to define the lower bounds of sugar-production costs to guard against overstating these costs. The situation for Chinese debtors would look even worse in a more accurate accounting.

Good studies of sugar-production costs are unavailable prior to the turn of the twentieth century when Japan colonized Taiwan. However, the technology to produce sugar in Taiwan remained

23 *Generale Missiven*, II, 605–613 (cited in *Dagregisters Zeelandia*, III, 294). Japan Factory, 851, *Negotie Journaal*, 1652 (the Japan Factory's archive is in the National Archive, The Hague; the number is the inventory number).

24 *Dagregisters Zeelandia*, III, 536.

unchanged between the two colonial eras. The two-roller, cattle-driven, vertical sugar-cane crusher that the Japanese discovered on the island was almost identical to one illustrated and described by Ying-hsing Sung in *T'ien-kung k'ai-wu*, a book about seventeenth-century Chinese technology. According to a Japanese survey, in a typical mill labor costs accounted for only half of the total expenses, which also included payments for construction, machinery, cattle rental, forage, auxiliary materials (such as oyster ash or bean oil), and packaging.[25]

If our assumption that half of the pepper loans granted in 1651 also went to paying operating costs other than labor compensation is correct, the farmers were left with no more than 17,000 reals—half of the total pepper loan. If Chinese debtors honestly repaid their pepper loans, the Dutch would have deducted 40,000 reals from their sales of sugar, the value of which was a percentage of the 54,480 reals, as previously estimated. If p denotes the proportion of sugar produced by the farmers who received pepper loans, the money remaining to compensate a vast number of sugar farmers would be $17{,}000 + 54{,}480p - 40{,}000 = 54{,}480p - 23{,}000$ (reals). Some of the Chinese population of 14,400 in Taiwan during the mid-seventeenth century were rice farmers. If the proportion of the population engaged in sugar production were the same as the proportion of the fields engaged in sugar-cane cultivation, the number of Chinese farmers engaged in sugar production was around 6,000 ($14{,}400 \times 1{,}380/[1{,}380+1{,}924]$), of whom about $6{,}000p$ persons worked for mills that received pepper loans. On average, these farmers would have received $(54{,}480p - 23{,}000)/(6{,}000p)$ reals per capita, which has a maximum value of 5.24 reals when p equals 1, assuming that pepper loans were fully returned.[26]

Recall that the monthly poll tax started at 0.25 real in 1640, increasing later by one-sixth to make the poll tax before the revolt

25 Ying-hsing Sung (trans. E-tu Zen Sun and Shiou-chuan Sun), *T'ien-kung k'ai-wu: Chinese Technology in the Seventeenth Century* (University Park, 1966); Ri-n Ji T'ai-wan Kiyuu Kan Chi-yo-u Sa Kai (Provisional Taiwan Old-Custom Survey Committee) (ed.), *Chi-yo-u sa ke-i za-i shi ri-yo-u ho-u ko-ku* (Economic Survey Reports) (Tokyo, 1905), I, 166–167.

26 The equation actually contains three different references to time. Sugar producers had 17,000 reals in hand probably by the end of 1651 after they sold pepper. Their revenue of $54{,}480p$ reals should have been obtained in the first half of 1652; the debt of 40,000 reals was stated in October 1652. Since we do not have the exact timing for these three numbers, we do not use a discount factor to compute their present value. But discounting would not affect our argument to any significant degree.

3.5 reals per year. Since a farmer's annual income was less than 5.24 reals, the poll tax was the equivalent of an unbearable income-tax higher than 67 percent (3.5/5.24). Chinese debtors could not help but to default on delivering sugar if they were to compensate their sugar workers.

Default, however, was not an attractive option. Faij-it and the other rebels must have been aware that only one year earlier, the Dutch had shown no mercy to bankrupt village leaseholders, all of whom were jailed. In light of the consequences for defaulting, the farmers chose to revolt. Although in hindsight, their actions yielded the worst possible result, the revolutionaries might have been successful had they been able to seize Dutch weapons in a surprise strike.

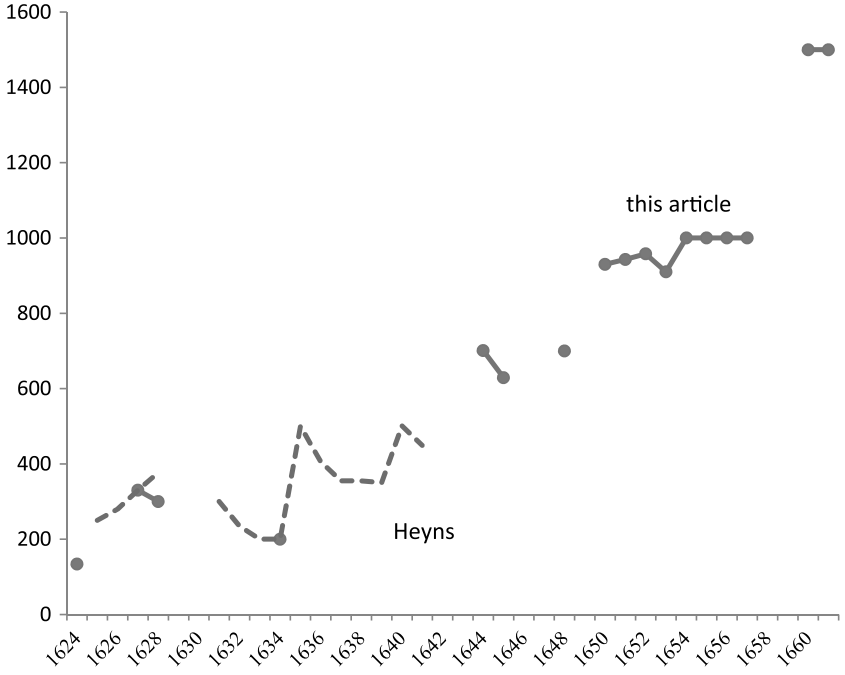
THE AFTERMATH OF THE REVOLT Prior to the revolt, Faij-it and his fellow leaders had claimed that 30,000 Chinese troops would come to their aid from across the Taiwan Strait; their followers must have been sorely disappointed when these troops failed to appear. The leaders had also told their followers that the indigenous people of the island had promised to join them in the revolt, but the indigenous people sided with the Dutch, rewarded with one piece of cloth for each severed Chinese head that they presented. The man who presented Faij-it's head earned 50 reals.[27]

In the wake of the revolt, as mentioned previously, collection of the poll tax devolved to the Chinese, and the VOC's loans to finance sugar production decreased in size. These measures were intended to ease tensions between the Dutch and the Chinese. To strengthen their defense, the Dutch constructed a new castle in Provintia, near Saccam, where the revolutionaries had resided.

Interestingly, the VOC adopted a military strategy that was capital-intensive rather than labor-intensive. The cost of building Provintia Castle, 110,000 gulden, brought complaints from Batavia, but the garrison in Taiwan was not enlarged. Figure 4 depicts the number of soldiers in Taiwan from 1624 to 1660. The size of the garrison tended to increase through the years, but it remained stable between 900 and 1,000 before and after the revolt. The increase in the size of the garrison at the end of the colonial era was due to an

27 VOC 1194, 160r, letter from Verburg to Reniersz in Batavia, Tayouan, November 25, 1652; VOC 1194, 128r, letter from Verburg to Reniersz in Batavia, Tayouan, October 30, 1652.

Fig. 4 Size of the Garrison in Taiwan by Number of Soldiers



SOURCES (1) This article's data, where noted in figure, derives from Shaogang Cheng, *He Lan Ren zai Fu Er Mo Sha* (Taipei, 2000), 50, 77, 88, 163, 186, 238, 264, 327, 278, 315, 327, 337, 361, 396, 420, 440, 455, 495, 515, 530, 548; *Generale Missiven*, I, 200; VOC 1093, 342r, Tayouan's resolution, December 30, 1624, National Archive, The Hague. (2) For the various sources that Heyns cites, see Heyns, *Dutch Formosa*, 42–43.

expected Chinese invasion across the Taiwan Strait, which occurred in 1661. The Dutch surrendered to the Ming loyalist warlord Koxinga in February 1662 after Zeelandia Castle, then the Dutch stronghold in Taiwan, endured a siege of nine months.[28]

In attempting to understand the economic background of Faij-it's revolt, this study had to work around the absence of the year 1652 from the *Dagregisters Zeelandia*, the diligently kept diaries of the Dutch in Taiwan that constitute the best available source about the period.

28 Initially, the plan was to build a redoubt costing 20,000 gulden (*Generale Missiven*, II, 612). In July 1654, the cost of building the castle was estimated to be 100,000 gulden (*Dagregisters Zeelandia*, III, 362), but when it was finished in 1655, the cost had reached 110,000 gulden (Cheng, *De VOC en Formosa*, 441). Andrade, *Lost Colony: The Untold Story of China's First Great Victory over the West* (Princeton, 2011).

The biggest challenge was to determine who Faij-it was, and what he did, before the revolt. The report of Taiwan's Governor Verburg depicts Faij-it as a farmer in the Amsterdam polder at Saccam. New sources, however, reveal him to have been a sugar producer who received a pepper loan from the Dutch to finance sugar production in the 1651/52 season. The disappointing harvest would have prevented Faij-it and others from reasonably compensating their workers if they repaid their loans, especially considering the burden imposed by the poll tax. Supporting this conjecture are the statements of captives who confessed that they were drawn into the rebellion by promises that a defeat of the Dutch would mean a repeal of the poll tax. The most likely reason for the rebellion was to eliminate the creditors. As such, the nature of Faij-it's revolt was the same as the concurrent sugar-planters' revolt in Brazil.[29]

Even though more than one-sixth of the Chinese population was lost in the Dutch suppression of the revolt, no lingering trace of hatred between the Dutch and the Chinese is evident in its wake, at least according to the Dutch sources. When the fighting stopped, the Dutch informed those Chinese who did not participate that they could continue with their normal lives. The fact that the seven informants were leaders in Chinese circles indicates that the Chinese were not unilaterally in favor of the revolt. In fact, the Chinese had hosted a party for the VOC's officers and their wives on November 11, 1651, just ten months before the revolt, welcoming their Dutch guests with music, serving them Dutch cuisine, and entertaining them with puppet shows. If Faij-it's revolt had not taken place, a largely harmonious relationship between the Dutch and the Chinese in Taiwan would have seemed the norm. After the revolt, the Chinese continued migrating to Taiwan; nine years later, on the eve of the Dutch withdrawal, the Chinese population in Taiwan doubled to reach 25,000.[30]

The siding of indigenous people with the Dutch to repress the revolt should by no means indicate an enduring cordial relationship. In less than a decade, when Koxinga launched his attack on

29 VOC 1194, 121r and 128r, letter from Verburg to Reniersz in Batavia, Tayouan, October 30, 1652.

30 *Dagregisters Zeelandia*, III, 285; VOC 1194, 130, letter from Verburg to Reniersz in Batavia, Tayouan, October 30, 1652. For a discussion of the Chinese population in Dutch colonial Taiwan, see Koo, "Sugar Production," 2–6.

Taiwan, the villages that the Dutch once counted as their closest allies switched sides, immediately pledging their loyalty to the Chinese soldiers. The triangulated relationship between the Dutch, the Chinese, and the natives of Taiwan is a subtle story. In 1652, a disappointing harvest caused by an unusual shortage of rainfall was responsible for upsetting their customary harmony; the poll tax in conjunction with the lowered income exacerbated the tension.[31]

31 Andrade, *Lost Colony*, 168.