Ordinary Landholder Living Standards in Early Twentieth-Century Siam

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ABSTRACT

In the late-nineteenth and early-twentieth centuries, Siam's labor market was largely ethnically segregated with Thais engaged mainly in agriculture and Chinese immigrant labor engaged in wage work in and around Bangkok. The factors contributing to the labor market segregation and the slow transition of Thais from agricultural work into urban wage work has long been the subject of debate among scholars of Thai economic history. The purpose of this paper is to evaluate the relative standards of living between orchard cultivators, paddy cultivators, and urban unskilled wage workers in order to help clarify why Thais did not move into wage work in the early twentieth century. Utilizing a sample of garden title deeds from 1901-1906, this study first establishes that orchard land was owned by smallholders who engaged in primarily in areca nut cultivation for the local market. Orchard revenues calculated based on the fruit tree inventories listed on the title deeds are similar to existing estimates for paddy profits and annual wages for unskilled workers. Good profits from agricultural goods and relatively good work conditions likely made agriculture a much more attractive option than urban wage work for Thais at the turn of the twentieth century.

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INTRODUCTION

Throughout much of the nineteenth century, the Siamese government encouraged the opening of new lands by granting land deeds to settlers who cultivated previously unclaimed plots for three consecutive years. Since land deeds were only issued to those who physically worked the land, the Law is believed to have resulted in the settling and cultivation of new lands primarily by smallholders. In his description of traveling through the streets of Bangkok in the first decade of the twentieth century, P. A. Thompson wonders, "[b]ut where all this while are the Siamese?...Of the humbler classes three out of every four who we have met so far are Chinese" (Thompson , 1910, p. 37-38). Since Thompson's time, the factors contributing to the slow transition of Thais from agricultural work into urban wage work in the late-nineteenth and early-twentieth centuries has been the subject of debate among scholars of Thai economic history, including Ingram (1971), Manarungsan (1989), and Ouyyanont (1998 and 2012). While several scholars have conjectured that wages for unskilled urban workers were not attractive enough to entice Thais out of agriculture and into wage work, few studies have assessed the issue using quantitative approaches and no studies to date have assessed the question in reference to agricultural households that produce for the domestic market.

The purpose of this paper is twofold. First, this study establishes the nature of early-twentieth century agricultural landownership through evaluating personal and plot characteristics of landowners engaged in fruit tree cultivation for the local market. Second, based on potential orchard output, this paper evaluates the standard of living of these landholders relative to rice cultivators and unskilled wage laborers in early-twentieth century Siam. This study primarily utilizes data contained in garden title deeds for orchards located on the outskirts of Bangkok dating from 1901 to 1905. The ownership and plot information are used to establish the extent to which ordinary Thais engaged in fruit tree cultivation. The deeds' fruit tree inventories are used to generate orchard revenue estimates that are then compared to existing income and purchasing power estimates for paddy cultivators and unskilled urban labor. The results will offer insight into the relative welfare of agricultural households and urban dwellers, as well as shed further light on the documented slow transition of Thais into wage work at the beginning of the twentieth century.

LITERATURE REVIEW

Interest on the impact of economic change on the wellbeing has led to a large literature on living standards among historical populations. The typical approach to the standard of living question is to construct wage and price series and to assess the affordability of a standard consumption basket of goods and services over time. Much of the previous literature has focused on Western Europe partially because of the availability of data appropriate for this type of research (see for example Lindert and Williamson (1983) and Van Zanden (1999)). More recently, several scholars have approached the standard of living question in Asia. For example, Özmucur and Pamuk (2002) and Yan (2011), have successfully constructed wage and price series and shed light onto the standards of living among historical populations in the Ottoman Empire and China, respectively.

The lack of appropriate data for many regions and time periods, however, often requires researchers to find alternative approaches to assessing living standards. In recent years there have been numerous studies that use anthropometrics to assess living standards (see the review article by Steckel (1995)). This approach has been especially useful in regions where wage data is often scarce or non-existent because of the nature of production, such as in largely agricultural communities. Recent work in Asia includes Baten et al. (2010), which compares standards of living across Asia and Europe. Standard of living work in Southeast Asia remains scarce, although Baten, Stegl, and van der Eng (2012) have recently employed anthropometrics to assess changes in the standard of living in colonial and post-colonial in Indonesia.

Siam presents an interesting case in which alternative approaches to assessing living standards must be pursued. Siam's economy has historically been agriculturally based with smallholder production accounting for the majority of output. Although Ingram (1971, p.57) asserts that agricultural wage labor was "the most important form of wage labor in which the Thai participated," no agricultural wage series has ever come to light. As export markets opened and urban Bangkok expanded during the second half of the nineteenth century, new urban wage work opportunities appeared. Chinese immigrants were the primary participants in wage work even though they made up a small proportion of the entire Siamese population. Thus, conclusions about standards of living based on urban wages—assuming a comprehensive wage series exists—would likely describe living standards among the Chinese immigrant population. Using anthropometrics as an alternative approach would be desirable, but currently there are no existing datasets that could be used for such an investigation.

It has been noted by several researchers, including Ingram (1971), Feeney (1982), Manarungsan (1989), and Oouyanont (2008 and 2012), that Thais did not flock to the urban center and engage in wage work in the late-nineteenth and early-twentieth centuries. The authors, however, do not share the same conclusions as to why this is the case. Ingram (1971, p. 57) believes that even though urban wages were likely relatively higher than agricultural earnings, Thais did not "respond" to the high wage rates. Manarungsan (1989) takes issue with Ingram's assessment. First, he notes that even if urban wages were higher than rural earnings, opportunities for wage work were still relatively scarce. Second, he argues that wage work was often uncertain, making steady agricultural work more appealing. Finally, he argues that farmers' likely earned as much or more than unskilled Chinese workers (Manarungsan (1989, p. 23).

Although there is wide speculation that income differentials between agricultural production and urban wages resulted in an ethnically segregated labor force with Thais working in agriculture and primarily Chinese immigrants working as wage laborers, to date there have been few attempts to verify this quantitatively. Feeny (1982) is one of the first to quantify changes in real wages around the turn of the twentieth century. He concludes that real wages of urban laborers likely declined, while rural incomes likely increased due the increase in rice prices as a result of increased export demand (Feeny, 1982, p. 29). Ouyyanont (2012) uses a mix of quantitative and qualitative evidence to argue that relative incomes of rural agricultural workers were higher than for unskilled urban workers prior to 1950. He cautions, however, that the existing wage series is fragmented and should be interpreted with care. Given the available quantitative and qualitative evidence, he concludes, "labour pressure was not severe, and the average peasant family could sustain a reasonable livelihood while still enjoying significant leisure time" (Ouyyanont, 1998, p.89).

Manarungsan (1989) provides the clearest picture of relative earnings between unskilled urban workers and rice farmers. According to his calculations, an unskilled worker who provided 180 days of labor in 1905 earned 190 baht (including room and board). He estimates that transplant rice farmers on two hectares of land, on the other hand, could earn a profit of 245 baht (Manarunsan, 1989, p. 168-169). This implies that Thais likely did not seek urban wage work because they earned higher incomes pursuing rice cultivation.

This paper adds to the relatively limited standard of living literature for Siam at the turn of the twentieth century. To date, the existing literature concentrates primarily on the

living standards among urban dwellers and rice farmers. This paper is the first to assess the relative living standards among ordinary agricultural households who produce for the local rather than the export markets. Since data limitations prevent the use of standard approaches to assessing the standard of living, this study uses an alternative approach based calculating potential household revenues from fruit tree inventories recorded on official tax records.

BACKGROUND

Nineteenth century land policies largely determined settlement and utilization patterns. According to Chitchang's (2006) historical analysis of the property rights in Siam, Thais had usufruct rights to land in Siam during the nineteenth century. The Siamese government encouraged the opening of new lands by granting title deeds to settlers who cultivated previously unclaimed plots for three consecutive years. The title deeds served two purposes. First, it established use rights to a specific plot. Second, it was a tax document that recorded the amount of tax owed annually for the right to use the plot. From the second half of the nineteenth century through the first decade of the twentieth century, paddy land taxes amounted to 0.375 baht per rai while orchards were taxed based on the number and variety of mature fruit bearing trees recorded on the land deed. [1]

By policy, land deeds were only issued to those who physically worked the land. The Law is thus believed to have resulted in the settling and cultivation of new lands primarily by ordinary smallholders and largely prevented the accumulation of large tracts of land (Feeny, 1982). To give a sense of the number of land claims, the Government reassessed taxes on approximately 30,000 orchards in Bangkok and neighboring Nonthaburi in 1886, suggesting that ownership was not concentrated among a few households.[2] As cultivation of rice for export became lucrative at the end of the nineteenth century and there was a growing need to engage in large-scale operations with wage labor and due to a growing number of land disputes, the Government enacted a new land policy in 1901 that granted rights to full ownership with land titling based on the Torrens system (Feeny, 1982).

[1] One hectare is equal to 6.25 rai.

[2] Separate titles were issued for paddy and orchard lands. The author does not currently have the figure for the number of title deeds issued for paddy land in the nineteenth century.

OWNERSHIP AND PLOT CHARACTERISTICS

The main data source used for analysis are *bai samkarn taen chanot suan* or duplicate garden title deeds issued by the newly established Department of Land Registration under the Ministry of Agriculture upon transfer or division of existing garden plots. The title deeds were written on preprinted tear sheets. The Department of Land Registration official filled in the right side of the document and then tore off this portion for the landowner to keep. The portion left inside the ledger contains duplicate information from the garden title deed and acts as an official copy that is then kept at the Department of Land Registration. The records for this study include 195 garden title deeds from five ledgers dating between 1901 and 1906, after the enactment of the1901 Law.

The duplicate title deeds were generated for two purposes: establishing legal ownership of transferred or subdivided orchards and the assessment of productive trees growing on the land for tax purposes.[3] The information included the landowner's name and detailed information about plot characteristics, including the district and sub-district where the plot was located, land measurements in the four cardinal directions, and descriptions of what or who bordered each side of the property. This sample includes 195 orchard plots belonging to 158 owners. Ownership information is presented in table 1.

Table 1: Landowner Characteristics

Ownership			First Listed Owner			Second Listed Owner		
Variable	Obs	Proportion	Variable	Obs	Proportion	Variable	Obs	Proportion
Single name on deed	158	0.72	Female	156	0.49	Female	45	0.69
Married couple on deed	158	0.21	Chinese	156	0.08	Chinese	45	0.07
Owns 1 plot	158	0.88	Nobility	157	0.07	Nobility	45	0
Owns 2 plots	158	0.08	Literacy	121	0.62			
Owns 3 plots	158	0.03						
Owns > 3 plots	158	0.01						

One of the goals of this project is to provide one of the first assessments of the composition of landownership in early-twentieth century Siam. 88 percent of the deed holders in this sample held one plot of land. In addition, the titles of the deed holders indicate that only seven percent of the deed holders were from the nobility and aristocracy. Overall it

[3] According to the Royal Decree "Remitting Old Arrears of Taxes on Fruit Gardens and Ordering a New Assessment of the Same for Amended Taxation" dating from 1911, the previous tax assessment on orchard trees was carried out in 1882. (Directory for Bangkok and Siam, 1914, 1914, p. 61)

seems that land was not monopolized by a few elite individuals, which is consistent with the pre-1901 land policies based on usufruct rights.[4]

The deeds provide limited information on individual owner characteristics, including sex, ethnicity (Thai or Chinese), and literacy (ability to sign name). In this sample, 72 percent of the deeds are in a single name while 21 percent are in the names of married couples. Unfortunately, it is not possible to determine if those who are listed as sole owners are single or married. Interestingly, it was a common practice in Siam to list both the husband's and wife's name on the title deed. It also appears that it was common for women to be listed as sole owners.[5] Overall, women comprised slightly more than half of the total names listed on the title deeds. Also, almost two-thirds of landowners could sign their names on the deeds.

The late-nineteenth century saw a rapid influx of ethnic Chinese into Siam. According to Skinner (1957), ethnic Chinese numbered 607,600 and made up approximately 8.3 percent of the total population in Siam. The ethnicity of landowners can be determined by the owner's title recorded on the land deed. Chinese owners have the title of *jeen* rather than *nai*, which is the title used for non-noble and non-bureaucratic Thai males.[6] Although Chitchang (2006, p. 73) points out that earlier land policies did not explicitly exclude the Chinese from claiming and making use of land, scholars generally agree that Chinese immigrants primarily engaged in wage labor and trade rather than pursue landownership and agriculture (see for example Ingram (1971), Skinner (1957), Manarungsan (1989) and Ouyyanont (1998)). Interestingly, eight percent of the landowners in this sample are Chinese, which is consistent with the overall proportion of Chinese in the population as estimated by Skinner (1957).

The plots in this sample are located in Bangkok and surrounding areas. 155 of the orchards are located in Bangkok, especially on the west side of the Chao Phraya river in present-day Thonburi, as well as south of the old city wall. 29 of the plots are located in Nonthaburi, a province north of Bangkok. The rest of the plots are located south of Bangkok

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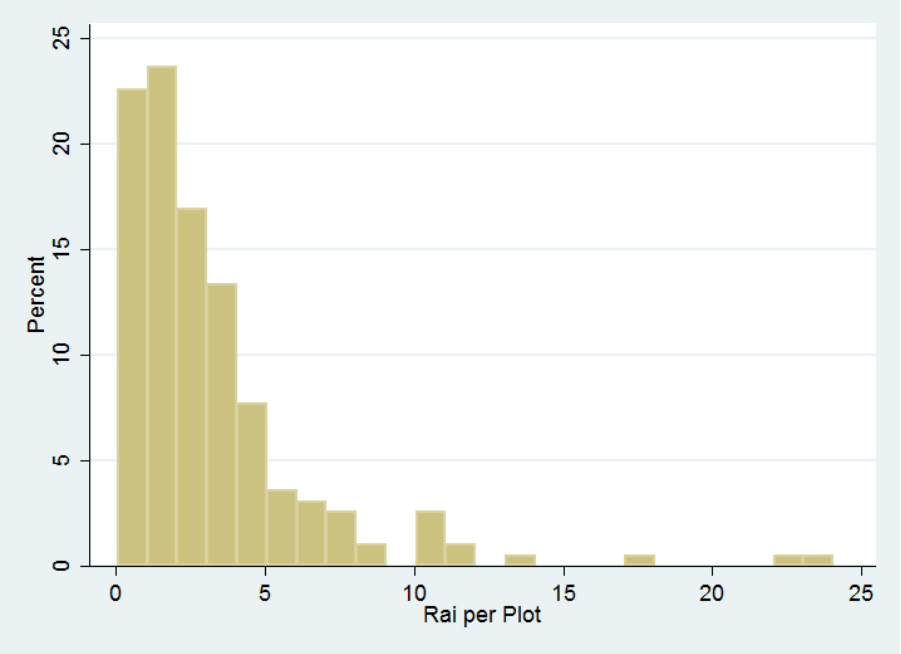
[4] Since these records represent transactions rather than a random sample of exiting deeds, the ownership characteristics, especially regarding the number of title deeds held by each owner, must be interpreted with caution. The author is in the process of obtaining a larger, more representative sample of orchard land tax records which should provide a clearer picture of owner characteristics.

[5] It was not indicated whether women listed as sole owners were unmarried, widowed, or married.

[6] It is likely that in owners identified as *jeen* were likely first or second generation Chinese.

in Nakorn Keuankan (present-day Bangchak area) and Samutprakarn. Plot size varied considerably across the sample, ranging in size from 0.7 rai to 23.16 rai. Figure 1 shows that most plots were less than three rai.

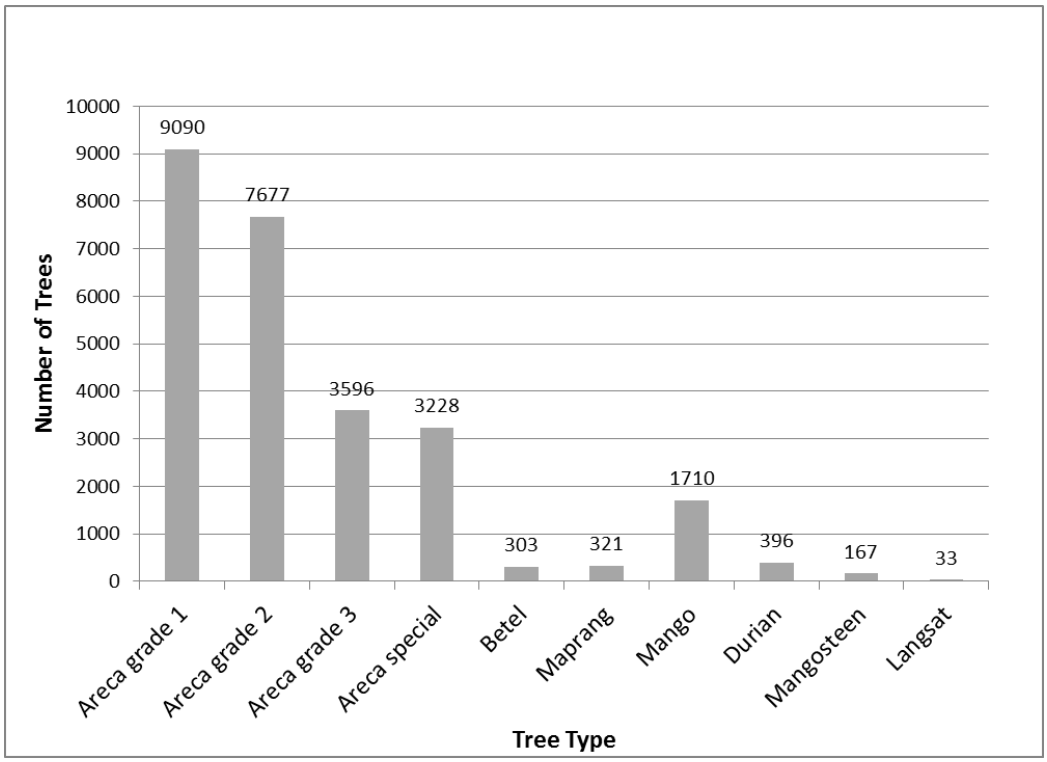
Figure 1: Distribution of Orchard Plot Sizes



Plots surveyed by the Royal Survey Department between 1901 and 1906 in the Central Plain areas of Ayutthaya, Nakorn Chaisri, and Prachin were estimated to be on average between nine and 22 rai (Feeny, 1982, p. 145). This means that the plots in this sample are relatively small compared to those in paddy growing areas.

Taxes on orchards are assessed based on the number of mature high-value fruit trees located on the plot, not the plot size. The tax information on the duplicate title deeds includes tax rates by tree type, an inventory of mature fruit-bearing trees, and the total tax assessment. The ten types of taxable trees include four varieties of areca nut, betel leaf, maprang, mango, durian, mangosteen, and langsat. The distribution of taxable trees is given in figure 2.

Figure 2: Distribution of Taxed Trees



The distribution's striking feature is that approximately 90 percent of the trees assessed for taxes are various varieties of areca nut trees and betel vines. Areca nut chewed with betel leaf is a stimulant. Betel chewing was widespread in Siam during this period. As noted by P.A. Thompson, a former Royal Survey Department official in Siam, "[o]ld and young all chew the betel nut" (Thompson, 1910, p. 44). Given the widespread use of the stimulant, it is not entirely surprising to see that areca was cultivated extensively.

Although earlier research by Van der Heide (1906) and Manarungsan (1989) suggests agriculture outside of paddy, sugar, and pepper was subsistence in nature, the distribution of trees in this sample suggests otherwise. The conclusion that agriculture was largely subsistence agriculture during the nineteenth century is partially based on the fact that Bangkok, the largest city in Siam, was a relatively small city in the nineteenth century. Manarungsan (1989, p.11) infers that the lack of large urban center hampered the development of commercial activities. This argument implies that the lack of urban market would also hamper the development of commercial crops for domestic consumption. The picture painted by the current data, however, puts this conclusion in doubt. Given that the vast majority of trees under cultivation were areca trees and areca nut was not a major export crop, it is likely that there was a healthy and lucrative domestic market for the crop.

Another indicator that there is a viable market for fruit from taxable trees is that, according to policy, the Government assessed tree taxes annually in cash rather than in kind. According to the "Notification Introducing Changes to the System of Collection and Rates of Paddy Land Tax," taxes on agriculture ceased to be collected in kind during the reign of King Rama III in the mid-nineteenth century (Directory for Bangkok and Siam, 1914, 1914). Although policy is not always enforced as written, an article written in the 1890s on fruit tree cultivation suggests that taxes were in fact collected in coins. The writer notes that one of the expenses of fruit tree cultivation is the payment of taxes as listed on the garden title deed in cash (Department of Fine Arts, 2008, p. 47). Table 2 lists the per tree tax rates and the total annual tax assessment for the 134 plots in which the title deeds included tree inventories. [7]

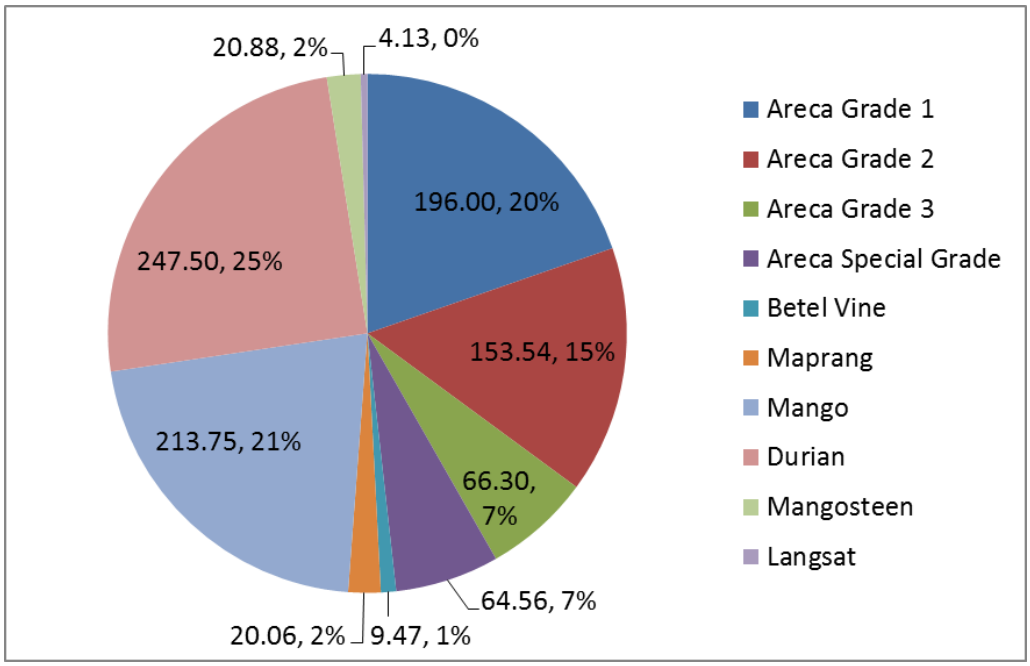
Table 2: Orchard Tree Tax Rates and Total Tax Assessments

Tree Type	Tax Rate (Baht)	Total Enumerated Trees	Total Assessed Taxes
Areca Grade 1	0.022	9090	196.00
Areca Grade 2	0.020	7677	153.54
Areca Grade 3	0.018	3596	66.30
Areca Special Grade	0.020	3228	64.56
Betel Vine	0.031	303	9.47
Maprang	0.063	321	20.06
Mango	0.125	1710	213.75
Durian	0.625	396	247.50
Mangosteen	0.125	167	20.88
Langsat	0.125	33	4.13

Although the records indicate that 90 percent of the trees taxed were areca nut, figure 3 shows the areca nut taxes only accounted for half of the annual taxes collected. 46 percent of the tree tax revenues came from durian and mango cultivation.

[7] 134 of the title deeds listed the quantity of each type of tree. Some deeds, however, did not record the trees since the government inspector deemed the taxable amount unchanged from the previous assessment in the 1880s.

Figure 2: Total Tax Assessment in Baht by Tree Type



The overall picture that emerges from the duplicate title deed records is one of largely ordinary Thais engaged in orchard agriculture on plots of modest size. The primary tree crops grown in the Bangkok vicinity are not edible fruit trees, but rather the cash crops of areca nut and betel leaf.

Assessing the Standard of Living

This section attempts to compare potential orchard revenues to existing estimates of paddy field profits and unskilled labor income. Using historical information on expected revenues from areca, betel, durian, and mangosteen, I construct after-tax revenue estimates per plot and per rai across the distribution of tree holdings found in the duplicate garden title deeds. Next, these estimates are compared to potential profit estimates for typical paddy landholdings and to existing urban unskilled labor income estimates.

Orchard Revenue Estimates

The fruit produced by taxable trees are almost exclusively consumed locally. This unfortunately presents a challenge when finding appropriate price and/or revenue estimates for the crops represented in this series. The orchard tree revenue estimates used for this study come from the book *Siamese Professions [Wicha acheep chao Siam]*, which is a compilation of short articles written between 1890 and 1891 describing various professions in Siam. The article on raising fruit trees was written by a gardener who provides estimated revenues for

four of the seven varieties of fruit, namely areca, betel leaf, durian, and mangosteen, in a typical year. Unfortunately, mangos—which were grown on 87 percent of the plots—were not included in the estimates. Since 90 percent of the trees in the garden title deed sample were in fact areca, the revenue estimates should still be plausibly calculated given revenue information available. The revenue estimates are given in table 3 below.

Table 3: Estimated Orchard Crop Revenue, 1890-1891

Tree Type	Estimated Revenue per Tree (Baht)	Tax per Tree (Baht)	Estimated After-Tax Revenue per Tree (Baht)
Areca	1.00	0.02	0.98
Betel Vine	3.02	0.031	2.99
Durian	7.38	0.625	6.76
Mangosteen	2.46	0.125	2.34

Source: Author's Calculations from Department of Fine Arts, 2008, p. 45-46

Given the per tree revenue estimates in table 3, potential after-tax revenue was then calculated for each plot that recorded tree information. Since the plot sizes and intensity of cultivation varied greatly across the plots, table 4 reports estimated revenues across the entire distribution of plots in addition to the mean value.

Table 4: Estimates of Potential Annual After-Tax Orchard Revenues

	Rai	Trees	Potential Revenue After Tax per Plot (Baht)	Potential Revenue After Tax per Rai (Baht)
Mean	3.64	197.98	199.97	68.84
20th Percentile	1.4	46	26.45	12.36
40th Percentile	2.26	95	88.16	40.44
60th Percentile	3.21	159	177.05	69.23
80th Percentile	4.97	329	337.73	113.46
Maximum	23.16	959	831.07	294.11

Source: Author's calculations based on title deeds. Potential revenues are based on the four crops for which revenue estimates are available in Department of Fine Arts, 2008, including areca nut, betel leaf, durian, and mangosteen.

On average, each plot owner cultivated about 198 trees and could earn about 200 baht in revenues after paying taxes. The median values (not reported) are slightly lower at 122 trees and 125 baht per plot. On a per rai basis, the mean estimated revenue was 69 baht per rai and the median was slightly lower at 56 baht per rai.

It is important to keep in mind that these estimates are likely low since 87 percent of the plots cultivated mango trees and mango revenues could not be accounted for. Also, the

estimates do not take into consideration revenues from secondary products made from the taxable trees, produce from intercropped non-taxable trees, or other types of farm produce grown on the properties. In addition, these estimates do not take into account the cost of inputs, although the article on cultivating fruit in *Siamese Professions [Wicha Acheep Chao Siam]* indicates that tree crops such as durian are not labor intensive and require little intervention compared to other crops such as sugar cane (Department of Fine Arts, 2008, p. 49).

PADDY REVENUE ESTIMATES

In order to interpret the magnitude of the orchard revenue estimates, it is necessary to compare against paddy cultivation profit estimates based on existing information on farm gate paddy prices and the sizes of typical landholdings in the late-nineteenth and early-twentieth centuries. Table 5 calculates potential profits per rai of paddy land according to Manarungsan's (1989) estimates on paddy production, area under cultivation, farm gate prices, and input costs.

Table 5: Paddy Production and Potential Profits per Rai, 1890-1905

Year	Total Paddy Output (Metric Tons)	Area Under Cultivation (Rai)	Output per Rai Adjusted for Transplant Farming (Metric Tons)	Farm Gate Price (Baht/Metric Ton)	Estimated Revenue per Rai (Baht)	Estimated Profit per Rai after Tax (Baht)
1890	2,086,000	7,450,000	0.372	25	9.31	7.42
1895	2,221,000	7,938,000	0.372	35	13.02	10.53
1900	2,261,000	8,081,000	0.372	35	13.02	10.53
1905	2,817,000	10,969,000	0.342	60	20.49	16.78

Source: Manarungsan (1989, p. 46, 51, and 54)
Notes: Manarungsan suggests that transplant rice farming results in one-third greater rice yields, thus the output per rai is adjusted up by one-third. Total cost is assumed to be 16.3% of total revenues based on Manarungsan's (1989, p. 169) rice farming profit calculation for transplant rice farmers in 1905.

The estimated revenue on a per rai basis ranges between 7.42 and 16.78 baht. Comparing these figures to the per rai revenue estimates for orchards, one finds that fruit tree cultivation is relatively lucrative. In fact, the median revenue per rai of orchard land is about three and a half times the per rai paddy profit estimate of 16.78 baht in 1905.

According to Feeny (1982, p. 145), the Royal Survey Department estimated that typical Central Plain landholdings amounted to between nine and 22 rai in the years 1900-1906. Given Feeny's (1982) and Manarungsan's (1989) estimates on land size and profit estimates, respectively, potential profits per plot are calculated and presented in table 6.

Table 6: Potential Profits per Typical Plot, 1895-1905

Year	Profit per Rai (Baht)	Potential Profit After Tax (Baht)				
		9 Rai	12 Rai	15 Rai	18 Rai	21 Rai
1890	7.42	67	89	111	134	156
1895	10.53	95	126	158	189	221
1900	10.53	95	126	158	189	221
1905	16.78	151	201	252	302	352

Sources: Profits based on calculation in table 6; landsize estimates from Feeny (1982, p.145)

The estimates vary widely depending on the time period and the plot size. For the sake of comparison in the final section, I will use the mid-range profit estimates based on the 1895/1900 prices.

UNSKILLED LABOR INCOME ESTIMATES

To date, there are few observations on labor income for the late-nineteenth and early-twentieth centuries. Part of the reason is due to the fact that the vast majority of Thais lived outside the urban center and ware engaged in agriculture. Unskilled wage laborers in Bangkok during this time period tended be recent Chinese immigrants. The following wage estimates in table 7 are compiled by Feeny (1982) from various primary and secondary sources.

Table 7: Wage Estimates for Unskilled Labor in Bangkok

Year	Daily Wage (Baht)	Annual Wages (Baht)	Annual Wages Including Value of Room and Board (Baht)
1896	0.5	90	108
1898	0.5	90	108
1899	0.625	112.5	135
1901	0.83	149.4	179.28
1902	0.875	157.5	189

Source: Wages compiled by Feeny (1982, p.132) from various primary and secondary sources; annual wages based on Manarungsan's estimate of 180 days of work per year; room and board equivalent to 20% of wages.

Annual wage income including the value of room and board is calculated based on Manarungsan's (1989) methodology. Specifically, the number of annual workdays is

assumed to be 180 and the value of room and board is assumed to be 20% of wages.[8] The annual wage estimates will be compared to annual agricultural revenue in the next section.

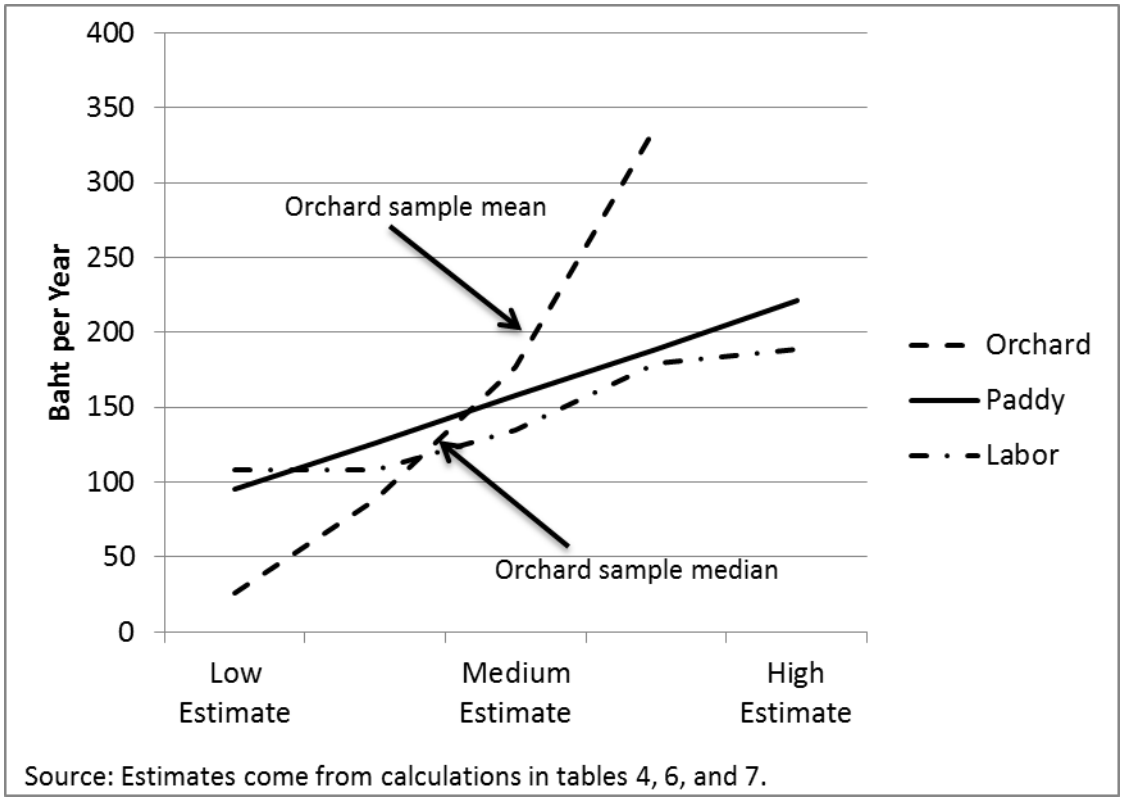
INCOME AND STANDARD OF LIVING COMPARISONS

This final section compares potential annual revenues from agricultural production to annual unskilled labor income in Bangkok. This exercise is not as straightforward as one would hope since the nature of labor income and agricultural income is very different. Labor income is earned on an individual basis and, as argued by Manarungsan (1989, p. 166), is often temporary since much of it was project-based. Agricultural income, however, is likely generated at the household level. Agricultural work may be intense at certain times of the year such as planting and harvest time, but at other times of the year there is little work to do.

Figure 3 offers a visual comparison of several estimates on agricultural income and unskilled worker annual wages. The plot includes four to five estimates on revenues, profits, or wages from low to high. The orchard revenue estimates come from the quintile observations (20^{th}, 40^{th}, 60^{th}, and 80^{th} percentiles) on potential after tax revenues per plot presented in table 4. The paddy estimates are based on the 1985/1900 farm gate paddy price of 35 baht per metric ton. The five estimates relate to the estimated revenue for various plot sizes ranging from nine to 21 rai in table 6. Finally, the annual wage estimates including the value of room and board come from the five wage estimates over the years 1896 to 1902 presented in table 7.

[8] Manarungsan gives no justification for the use of 180 days as the basis of calculating annual wage income. I have used this convention because at this time I have no other estimates for the typical number of work days per year for wage labor.

Figure 3: A Comparison of Agricultural Income and Urban Unskilled Labor Income Estimates



There are several observations one can make about the picture that emerges in figure 3. First, the range of estimates for annual paddy profits and unskilled worker wages are very similar. If the earnings from wage work and paddy farming were almost identical, it is likely that the decision to remain in agriculture came down to factors such as the cost of moving, the uncertainty of income, and preferences for agricultural work over the jobs offered in Bangkok. Also, this estimate does not take into account that paddy farmers have cheaper access to rice. Thus, in real terms, annual paddy profits are likely higher.

In terms of fruit tree growers, there is a wide variation in estimates because the estimates represent different points within a single distribution rather than means from several samples. This makes it difficult to make a single conclusion. The median orchard generates 125 baht per year, which falls within the range of labor income estimates and the lower end of paddy profit estimates. The mean revenue estimate of 200 baht per year is greater than all of the labor income estimates and all but the highest paddy profit estimates. This suggests that plots of modest size cultivated intensively with tree crops for the domestic market had the potential to generate incomes much greater than wage labor incomes. The

median per rai revenue estimate is 56 baht, which is more than times more income per rai than for paddy in 1895/1900.

The analysis thus far illustrates relative incomes, but does not say anything about purchasing power. The final part of the analysis will generate rough estimates of purchasing power in terms of rice consumption. The analysis follows Feeny's (1982) methodology, which uses official estimates of rice export prices per metric ton to convert income into kilograms of rice. I calculate the purchasing power in terms of kilograms of rice and then turn this estimate into the number of people who could be supported nutritionally if all annual income were spent on rice.[9] The purchasing power estimates are presented in table 8.

Table 8: A Comparison of Purchasing Power in Terms of Rice Consumption

		Orchard			Paddy			Unskilled Urban Labor		
Year	Rice Export Price per Metric Ton	Estimated Revenue (Median of Sample)	Purchasing Power in Kilograms of Rice	Number of People Supported Annually	Estimated Profit (15 Rai Plot)	Purchasing Power in Kilograms of Rice	Number of People Supported Annually	Annual Wages (Including Room and Board)	Purchasing Power in Kilograms of Rice	Number of People Supported Annually
1896	73.5	125	1,701	10.00	158	2,150	12.65	108	1,469	8.64
1898	83.1	125	1,504	8.85	158	1,901	11.18	108	1,300	7.64
1899	84	125	1,488	8.75	158	1,881	11.06	135	1,607	9.45
1901	86.6	125	1,443	8.49	205	2,367	13.92	179	2,067	12.16
1902	86.1	125	1,452	8.54	205	2,381	14.01	189	2,195	12.91

Notes: Paddy profits based on calculations in tables 5 and 6. Note that the farm gate price estimate for paddy jumps from 35 to 45 baht per metric ton in 1901, which increases profit estimates from 158 to 205 baht per 15 rai. Wages come from Feeny (1982) table A1-5 and workers are assumed to work 180 days per year. Annual rice consumption per person is based on Feeny's (1982) estimate of 170kg.

The median orchard revenue of 125 baht is the equivalent to providing enough rice to feed 8.5 to 10 people. Urban unskilled laborers could provide rice to 7.64 to 12.91 people per year. Paddy farmers—abstracting away from the fact that these farmers would consume their produce rather than purchase rice in the market—could support approximately 11 to 14 people per year with profits from 15 rai of land. Naturally, households have other expenditures other than rice, such as clothing, areca and betel, and other necessities. This simple exercise does not take into account other ordinary expenditures, although the author plans to pursue a more sophisticated analysis in the future.

To put these estimates into perspective, it is helpful to know the average household size in the early-twentieth century. Published figures from the first successful census in 1911 include population counts, but no household-level information. Van der Heide (1906)

[9] Since I am trying to compare purchasing power, the number of people who could be supported nutritionally is calculated off the purchasing power of the revenues rather than the nutritional output of paddy fields.

estimates that the average household size is about five people around the turn of the twentieth century. The earliest figures from a representative sample of households that I am aware of are from Zimmerman's (1931) study. Zimmerman's survey found that the average agricultural household size ranged from five to six people in the Central Plain area, corroborating Van der Heide's (1906) estimate. This implies that both cultivators and wage laborers could easily provide necessary nutrition to an average household and have additional income available for other purchases.

LIMITATIONS

There are several limitations to this study that need to be addressed. First, the revenue estimates for orchards are based on nominal revenue figures from the early 1890s rather than the 1900s. This would be no problem if there was no inflation between 1890 and 1905. To date there are only price estimates on internationally traded goods such as rice (export) and cloth (import). These prices have been used to construct terms of trade indices and used to some extent to explore the standard of living (see for example Ingram (1971), Feeny (1982) and Manarungsan (1989)). These price series do not, however, say anything about the changes in prices for domestically produced and consumed goods. The last decade of the nineteenth century and the first decade of the twentieth century saw rapid increases in the export price of rice, which presumably also meant higher domestic rice prices as well. Nominal wages also went up rather dramatically during this period, as evidenced in table 7. Since price levels were generally increasing for food and labor, it is plausible that the prices for other domestically produced goods increased over this period as well. If that is the case, the estimates for orchard revenues (based on nominal 1890/1891 prices) may be entirely too low relative to paddy revenues and wages. It is hoped that further observations on domestic prices for domestic goods will come to surface and can be used to improve the orchard revenue and cost of living estimates.

Another important issue is that it is impossible to see from the duplicate garden title deeds whether or not the owners also have paddy field holdings. Although the majority of the garden plots are located in Bangkok, it is not out of the realm of possibility that the owners cultivated some paddy land as well. According to Zimmerman's (1931) findings, most rural people in his sample engaged in both fruit tree and paddy cultivation. Since tree taxes and paddy taxes were collected by different government departments, the garden title deeds may not reflect total landholdings. Without access to the paddy land title deeds, it is difficulty to make any conclusions on this issue.

One last limitation is that the orchard estimates do not take into account revenues from non-taxable fruit trees intercropped with taxable trees, other products produced from the byproducts of taxable trees, or any other cultivation that occurs on the land. Much of the chapter on cultivating fruit in the book *Siamese Professions* (Department of Fine Arts, 2008) is dedicated to maximizing revenues through intercropping and producing goods out of the byproducts of fruit cultivation. This limitation is difficult to solve, but does infer that revenue estimates based on taxable tree output undercounts total revenue.

CONCLUSIONS

The purposes of this study were to establish the nature of orchard land ownership and to evaluate the standard of living of among fruit tree cultivators producing for the local market in early twentieth-century Siam. Analysis of the sample of duplicate garden title deeds from 1901-1906 indicate that orchard land was in fact owned primarily by smallholders who are not a member of the nobility or aristocracy. This pattern of ownership is consistent with nineteenth-century land policies that granted usufruct rights to individuals who cleared and worked the land.

The distribution of trees grown on the plots in the sample indicates that there likely existed a lucrative domestic market for orchard produce, especially areca nut and betel leaf. This is an important finding since it is often assumed that agricultural households in the late nineteenth and early twentieth centuries engaged largely in subsistence agriculture. The fact that the tree taxes needed to be paid in coins also points to the existence of at least some market-based exchange.

The median estimated orchard income of 125 baht per year is similar to existing estimates for paddy profits and annual wages for unskilled workers. This amount is sufficient to meet the nutritional needs of a typical family of five people with leftover income for other necessary household expenditures. The estimated orchard income is likely low due to the absence of revenue information for mangos and due to the inability to account for revenues from intercropped produce. If this is the case, on average orchard cultivation likely provided income that was comparable or greater than unskilled urban wages. If the orchard owners also engaged paddy cultivation as suggested by Zimmernam's (1931) survey, then profits from agriculture likely greatly exceeded unskilled labor income. The combination of good profits from both domestic and export markets for agricultural goods, work that required

limited periods of intense effort, and the ability to remain living within the home community likely made agriculture a much more attractive option for Thais than urban wage work at the turn of the twentieth century.

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