

How the Landless Households Survive in Myanmar's Central Dry Zone: Focusing on the Role of Interlinked Credit Transaction between Toddy Palm Climbers and Traders

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Abstract

Myanmar has a large number of rural landless households, even in the Central Dry Zone (CDZ) which does not have extensive rice cultivation. A hypothesis which explains it is that the palm sugar (jaggery) production industry has historically absorbed the labor in this zone. Although the industry has been in decline in recent years due to the sluggish demand growth for jaggery and a lack of palm climbers, in some areas the industry is still active. This study, based on the data from a village in the CDZ, shows the high labor absorptive power of the jaggery industry and how the landless palm climbers make a living by renting palm trees from farmers and selling jaggery to traders. Our focus is on the special credit relations between the climbers and jaggery traders. Their interlinked transactions as sellers and buyers of jaggery and as debtors and creditors has continued for generations. The credit is mainly extended during the lean season for consumption purposes and repaid throughout the next production season of jaggery. Money for purchasing foodstuff and other necessities by the climbers is given priority before repayment. The whole system functions to ensure minimum subsistence of the climbers. The estimated implicit interest rate of 3.4% per month is lower than the normal rates charged by local moneylenders. This credit relation has persisted even though there is a microfinance program operated by an international NGO, which covers nearly half of the landless households.

1. Introduction

Myanmar is well-known for its high proportion of rural landless households. Though there are no official statistics on the extent of rural landlessness, according to Fujita's [2009] estimate, the share of landless households in the total households in the late 1990s was 41.3% on average.¹⁾ Interestingly, this share is not low even in the Central Dry Zone (CDZ), which does not have labor-intensive rice cultivation except in small areas under irrigation. In fact, Fujita [2009] showed that the share ranges from 20.0–44.5% in the six townships of Magwe District and 35.5–50.5% in the four townships of

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Accepted July 27, 2020

Kyaukse District (both districts are in the CDZ).

Many of the landless households have been able to survive in the dry climate because of the large average farm size; the upland crops, such as sesame, groundnut, and pulses and beans have created a high demand for hired labor.²⁾ The palm sugar (or jaggery) production industry is the other major source of employment, as there is an extensive cultivation of toddy palm trees in the CDZ. Historically, many landless laborers are toddy tappers (the trees are rented from owner-cum-farmers) who collect sap and produce jaggery.

It is reported that jaggery production has been the predominant occupation here since the Bagan Period in the 11th–13th century [Thant 2013].³⁾ The importance of the industry has been reported by Dalibard [1999], citing Lubeigt [1977] and Lubeigt [1979], that at the beginning of the 1970s, half of the sugar consumed in Myanmar came from toddy palm, and up to 28 million bottles of *arak* (wine) made from the sap were sold every year, representing about one bottle per inhabitant. Dalibard also pointed out that several hundred thousand people in Central Myanmar (mainly the CDZ) and more than a million people in Myanmar overall, lived on toddy palm at the time.

Jaggery production, especially palm climbing, is very laborious and dangerous. The climbing job is passed on from father to son. However, the younger generation is now increasingly reluctant to take up this job due to an increase in non-agricultural job opportunities in cities and the chance to move abroad. Moreover, toddy palm climbing is less remunerative because of the sluggish growth of demand for jaggery; people in Myanmar now prefer white sugar (made from sugarcane) over jaggery. As a result of these supply and demand factors, there has been a large-scale abandonment of palm trees in recent years. However, jaggery production is still active in some areas. The rural area surrounding Nyaung-U (Bagan) city is one such spot.

Research on the rural landless in Myanmar, including the CDZ, is limited. Fujita [2009], one such study,⁴⁾ clarified that the major occupation of the rural landless is either seasonal and/or casual agricultural labor and that they are caught in a trap of multidimensional poverty in terms

1) This estimate is based on the township-level data provided by the Department of Agricultural Planning, Ministry of Agriculture and Irrigation in Myanmar. Of the total 38 townships sampled from across the country, the share of landless households is recorded at 10.0–19.9% in five townships, 20.0–29.9% in six townships, 30.0–39.9% in eight townships, 40.0–49.9% in nine townships, 50.0–59.9% in two townships, 60.0–69.9% in four townships, 70.0–79.9% in two townships, and 80.0–89.9% in two townships. There is evidence that even in the late British colonial period the share was as high as about 40% (Saito [1982: 238]).

2) The evidence can be found in Takahashi [2000] and Kurosaki *et al.* [2004].

3) Thant [2013] is an historical study on toddy palm in Myanmar from 1752–1885 but it also includes significant information on the present situation of palm climbers based on fieldwork, though it is not presented systematically.

4) Other major studies include Saito [1980, 1982], Takahashi [1992, 2000], Kurosaki *et al.* [2004], and Okamoto [2008].

of income,⁵⁾ non-land assets,⁶⁾ and human capital (education). Hence, they are not considered creditworthy and have difficulty accessing credit, even from professional moneylenders.

Informal lenders, however, can at least partly overcome borrowers' lack of creditworthiness through interlinked transactions because interlinkages between different markets makes debt-collection much easier. Further, interest is often charged implicitly in these transactions, which lowers the borrowers' psychological barriers, even if the rate is actually high. Interlinked credit transactions take place widely in Myanmar, especially between (small-scale) farmers and traders, and farmers and agricultural laborers (in the form of advance wage payment). Okamoto [2008] observed both types of interlinked credit transactions in the villages she studied in Thongwa Township, Yangon Division (now Region).

In this context, the interlinked credit between the landless palm climbers and jaggery traders in the CDZ⁷⁾ is noteworthy. As shown later in detail, this credit is special because, firstly, it is provided mainly for consumption purposes during the lean season and repaid throughout the next production season of jaggery when the climbers sell jaggery to the traders and secondly, the traders allow the climbers to retain some money to buy foodstuff and other daily necessities before repayment. The whole system functions to ensure the minimum subsistence of the climbers. The major benefit for the jaggery traders from providing such credit lies in an assured procurement of jaggery.

However, despite the importance of jaggery production in the CDZ, very few studies are available on the landless palm climbers. Mizuno [2009] is an exceptionally detailed study but it does not mention the credit relations between the palm climbers and jaggery traders. Due to the special characteristics of this credit, to understand the livelihood of the climbers it is necessary to learn about their special credit relations with jaggery traders.

The major objectives of this study are two-folds. One, to show the high labor absorptive power of the jaggery production industry, thereby supporting the hypothesis that the industry has historically helped, at least partly, a large number of landless households to survive in the CDZ. Two, to clarify how landless palm climbers make a living by renting palm trees and selling jaggery to traders.

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- 5) LIFT [2012] also reported that the share of households with a monthly income of less than 50,000 kyat (US\$ 62.5) is 57.0% among the landless and 52.8% among farmers with less than five acres of land, compared to 30.6% among farmers with five to 10 acres, 18.5% among farmers with 10 to 20 acres, and 10.5% among farmers with over 20 acres.
 - 6) Saito [1980] also clarified that the gap between farm households and landless households is much higher in non-land assets than in income, based on her field survey in a Lower Burma village in the socialist period.
 - 7) It was originally reported in Fujita *et al.* eds. [2015]. It also reported the case of interlinked credit between maize farmers and traders (in the villages in northern Shan State) and between rubber farmers and traders/processors (in the villages in Mon State) and the case of advance wage payment from farmers to agricultural laborers (in the villages in Ayeyarwady Delta).

Our focus is on the special credit relations mentioned above. Their interlinked transactions as sellers and buyers of jaggery and as debtors and creditors has been continuing for generations. The study also shows how this credit system has persisted even though an international NGO has been operating a microfinance program for serving the credit needs of the poor for nearly 10 years.

This study was conducted in a village from Nyaung-U Township. After the first visit to the village in May 2013, we conducted four rounds of surveys there. First, a survey in June–July 2013, covering 156 sample households (of the 440 households in the village). Second, a survey in September 2015, covering all the palm climbers in the village (N=99, including three farm households). Third, a survey in December 2015, of all the jaggery traders in the village (N=20) and last, a quick survey in October 2017, on the marketing of jaggery after it is transported from the village.

The rest of the paper is composed of as follows. In Section 2, after explaining how the study village was selected, the outline of its economy is demonstrated, using the data of 156 sample households. Then, we present the population characteristics, household status in owning/renting-out/renting-in palm trees, and household income from various sources for five categories of households. Finally, the high labor absorptive power of the jaggery production industry is shown. In Section 3, based on the data of 99 palm climbers, the structure of cost of production and income earnings from jaggery production is analyzed. In Section 4, based on the data of 20 jaggery traders, the special credit relation between the palm climbers and jaggery traders is examined, which is the core of the study. In Section 5, the structure of the financial market in the village is presented and the credit from the jaggery traders (to climbers) is positioned in the whole financial markets and Section 6 concludes.

2. The Study Village

The study village was selected from the CDZ in a research project sponsored by the Japan International Cooperation Agency. The major objective of the project was to investigate the current status and problems of rural financial markets in Myanmar.⁸⁾

Table 1 demonstrates the villages in Nyaung-U Township that we visited in May 2013. The share of landless households in the six villages ranges between 22.2–75.4%, which confirms high landlessness. Village F was selected as the study village, considering its large number of landless palm climbers. Both domestic and international migration is also observed in the area, including Village F. PACT Global Microfinance Fund (PGMF), an international NGO, runs a microfinance

8) Fujita *et al.* eds. [2015] provides the report of the project. See footnote 7.

Table 1. Outline of the Six Villages in Nyaung-U Township

		A	B	C	D	E	F
No. of households	Farm HHs	80	130	150	185	80	200
	Landless HHs	126	37	75	216	245	240
	Total	206	167	225	401	325	440
% of landless HHs		61.2%	22.2%	33.3%	53.9%	75.4%	54.5%
No. of palm climbers		34	n.a.	small	116	0	150
Farmland (acres)		1,000	1,624	n.a.	1,460	900	1,000
Major crops		Groundnut	Groundnut	Groundnut	Groundnut	Groundnut	Groundnut
		Sesame	Sesame	Sesame	Sesame	Sesame	Sesame
		Green gram	Green gram	Green gram	Green gram	Green gram	Green gram
Agricultural wage rate (Kyat/day)	Male	1,500	1,500–2,000	2,000	1,500	2,000	2,000
	Female	1,000	1,000	1,000	1,000	1,500	1,500
Domestic migrants	No.	200	35–65	100	n.a.	over 100	100
	Year started	2006	2003	2008	2006	last 20 yrs	2000
International migrants	No.	n.a.	3	25	8	25–30	74
	Year started	n.a.	2008	2008	2007	2003	2003
Microfinance program by PGMF	Year started	2008	2010	2007	2008	2009	2005
Interest rate of informal credit (per month)	with collateral	5%	3–5%	n.a.	n.a.	5%	4–5%
	w/o collateral	10–15%	10%	n.a.	n.a.	7%	8–10%

Source: Prepared by authors, based on interview with head of the villages in May 2013.

Note: PGMF means the PACT Global Microfinance Fund.

program in all the villages.

The study village is located in a “pure” rural area, free from the direct influences of urban areas. The distance from the village to the two cities of Nyaung-U and Kyaukpadaung is 29 km and 30 km, respectively. The village is located about 4 km south by a dirt road from the highway that connects Nyaung-U and Kyaukpadaung.

In June–July 2013, we conducted a household survey of 156 households (36% of the total) (see Table 2).⁹⁾ As shown in the table, 57.1% of the households are landless, of which 37 (41.6% of

9) All the households in a geographical cluster were selected for the sample.

Table 2. Basic Indicators of the Sample Households

Type of households	No. of HHs	Average no. of HH members	Average no. of labor forces		Average area of owned farmland (acres)	No. of HHs owing palm trees ¹⁾	No. of owned palm trees ¹⁾	No. of rented-out palm trees	No. of harvested palm trees (which were either rented-in or owned) in 2012 ¹⁾
			Working outside	In abroad (Malaysia)					
Palm climbers	37 (23.7%)	5.00	3.19	0.08	0	0	0	0	1,772 (48)
Landless HHs	52 (33.3%)	3.88	2.44	0.17	0	2 (3.8%)	430	430	0
Sub-total	89 (57.1%)	4.35	2.75	0.13	0	2 (2.5%)	430	430	1,772 (48)
Less than 5 acres	32 (20.5%)	4.13	2.72	0.19	2.2	13 (40.6%)	853	625	195 (49)
5-10 acres	16 (10.3%)	4.19	2.69	0.25	6.5	13 (81.3%)	2,175	1,655	30 (30)
10 acres and more	19 (12.2%)	4.16	2.63	0.16	13.4	16 (84.2%)	3,625	3,365	0
Sub-total	67 (42.9%)	4.15	2.69	0.20	6.4	42 (62.7%)	6,653	5,645	225 (45)
Total	156 (100%)	4.26	2.72	0.16	2.8	44 (28.2%)	7,083	6,075	1,997 (48)

Source: Survey by authors in June-July 2013.

Note: ¹⁾ Inside the parenthesis shows the average number of palm trees for either owned or rented-in households.

landless) are engaged in toddy palm climbing.

The palm trees are owned by farmers, especially medium- and large-scale farmers with more than five acres of land.¹⁰⁾ A total of 7,083 palm trees are owned, an average of 161 trees per owner household. However, approximately 15% of them are left untapped, mainly due to the shortage of palm climbers in the locality. Almost all the tapped trees have been rented out. We found that 42 households (including five farm households) had rented the palm trees (albeit the total number is unknown), but tapped only 1,997 trees in the 2012 season, an average of 48 trees per household.¹¹⁾ The number of tapped trees per climber household ranges from 10 to 100, with the highest being 40 (seven climbers), followed by 60, 50, and 30 (six climbers each).

As Table 2 indicates, the climbers have the highest average number of household members (5.00) and labor (3.19). The climber households need more family labor because their work is labor-intensive. By contrast, the landless non-climber households have the lowest number of household members (3.88) and labor (2.44). Note here that although major differences are not observed in the other demographic characteristics among the two categories of landless households on average,¹²⁾ there is one notable difference: the non-climber households included more households with “very young” (less than 30 years old) and “very old” (65 years old or more) household heads (11.5% and 28.8%, respectively) than the climber households (2.7% and 8.1%, respectively).

The table also shows that overall, 20.5% of the labor force are migrants, 71.2% of whom have migrated domestically while the remaining 28.8% have migrated abroad (mainly to Malaysia). Note that the share of international migration is much higher among the farm households (50.3%) than among the landless (19.1%) because migration to Malaysia is expensive (later we show more concrete data). International migration started in 2003 in the village; 70 people (including four women) were reported working in Malaysia in 2013. Most of them are unmarried and in their 20s or 30s.

Domestic migration started in the village in 2000, mainly to cities, such as Nyaung-U, Yangon, Mandalay, and Nay Pyi Taw. At the time of the survey in 2013, the daily wage rate for construction workers in Nyaung-U is 3,500 kyat¹³⁾ for men and 2,500 kyat for women (c.f. the daily agricultural wage rate in the village is 1,500–2,000 kyat for men and 1,000–1,500 kyat for women). It was reported that workers in factories and restaurants in Yangon are paid 30,000 kyat per month, in

10) Table 2 indicates that two landless households owned 430 palm trees; however, they were former farm households that had retained the trees when they sold the land.

11) In any particular year, climbers tap only a part of the rented trees, depending on the trees' condition.

12) The average ages of the household heads are 47.4 and 51.7 while the average number of years of education are 3.8 and 4.3, for climbers and non-climbers, respectively.

13) 1 US\$=928.5 kyat in 2013 (Central Bank of Myanmar).

addition to free food and shelter.

Table 3 is a summary of the estimated household income from various sources.¹⁴⁾ Income from crop production and jaggery production are estimated, assuming that net income is 60% and 90% of gross revenue, respectively.¹⁵⁾ As the table demonstrates, 21.5% of the total income is derived from jaggery production, much higher than the income from agricultural wages (6.0%) and closer to the income from crop production (27.2%). Note that because the income from jaggery trading is included in “non-farm business,” the contribution of jaggery industry as a whole is higher than 21.5%. It can also be inferred that jaggery production provides major employment to 41.6% of landless households, partial employment to 16.4% of farm households,¹⁶⁾ and rent income to 59.7% of farm households (plus 2.2% of landless households that owned palm trees but rented them out).¹⁷⁾ The high labor absorption and income generation power of the jaggery production industry is evident.

The table also indicates that the landless households, including palm climbers and others, have the lowest per capita income (about 190,000 kyat). The per capita income for farm households is 2.7 times higher on average than of the landless, with the highest income (4.7 times) earned by the large-scale farmers with more than 10 acres of land. A highly skewed income distribution is observed in the village. A large disparity in non-land assets is also observed between the different economic classes.¹⁸⁾

14) Income from livestock is not included (not estimated). The total number of livestock kept by the 156 sample households is: 72 bullocks, 25 cows, 7 calves, 12 pigs (piglets only), 81 goats, and 235 chickens.

15) The percentages are rough estimates by village informants. However, Table 5 indicates that net income from jaggery production is 87% of the gross income (after deducting rent) on average, thus very close to the 90% that we adopted for the estimation.

16) We use the term “major” for the landless palm climbers because they get almost full employment in the jaggery production season from January to July, but not from August to December, as explained later in Section 3, and the term “partial” for the farmers who are engaged in jaggery production in addition to farming.

17) Mizuno [2009] conducted a survey in a village in Nyaung-U Township (north of the highway connecting Nyaung-U and Kyaukpadaung, a bit further from our study village), reporting that, of the 205 households, 124 (60.5%) are farmers and 81 (39.5%) are landless. The landless, except for two tenants, are engaged in wage labor (71 households) or wage labor and non-farm jobs (8 households). Of the 71 wage labor households, 16 rented palm trees for jaggery production. Besides, of the 32 farmers who performed wage labor apart from farming, 12 are engaged in jaggery production. A total of 64 farmers obtained rent income from palm trees. In sum, the jaggery production sector in this village provided major employment to 19.8% of landless households, partial employment to 9.6% of farm households, and rent income to 51.6% of farm households.

18) The percentage of houses with a tin roof, brick wall, and brick/concrete floor is 31.4%, 7.9% and 10.1% respectively for the landless and 86.6%, 40.3%, and 43.3% respectively for farmers. The percentages of households owning major consumer durables are: 12% and 51% for motorbikes, 2% and 22% for mobile phones, 9% and 28% for TVs, 11% and 24% for bicycles, and 40% and 64% for radio cassette players for the landless and farmers respectively.

Table 3. Estimates of Household Income

Type of households	No. of HHs	Average income per HH (Kyat)							Per capita income (Kyat)				
		Crop	Self-tapping	Climbers	Jaggery production	Sub-total	Agri. agricultural wages	Non-agricultural wages		Non-farm business	Pension	Remittance and others	Total
Palm climbers	37	0	0	652,844	0	652,844	115,438 (12.0%)	67,959 (7.1%)	30,068 (3.1%)	0	91,892 (9.6%)	958,201 (100%)	191,640 (101)
Landless HHs	52	0	0	0	20,933	20,933	104,308 (14.2%)	197,500 (26.8%)	147,232 (20.0%)	19,362 (2.6%)	246,346 (33.5%)	735,681 (100%)	189,121 (100)
Sub-total	89	0	0	271,407	12,231	283,638	108,935 (13.2%)	143,646 (17.3%)	98,523 (11.9%)	11,313 (1.4%)	182,135 (22.0%)	828,189 (100%)	190,388 (101)
Less than 5 acres	32	303,430 (26.1%)	22,719	83,068	49,441	155,228 (17.0%)	67,806 (5.8%)	97,500 (8.4%)	133,484 (11.5%)	0	434,194 (37.3%)	1,191,642 (100%)	288,533 (153)
5-10 acres	16	801,581 (43.5%)	0	25,559	261,841	287,400 (16.7%)	12,656 (0.7%)	288,375 (15.7%)	10,625 (0.6%)	30,000 (1.6%)	556,250 (30.2%)	1,986,887 (100%)	474,197 (251)
10 acres and more	19	1,764,396 (51.6%)	19,132	0	448,324	467,456 (12.1%)	9,237 (0.3%)	434,526 (12.7%)	706,316 (20.6%)	0	346,316 (10.1%)	3,728,247 (100%)	896,213 (474)
Sub-total	67	836,695 (42.6%)	16,276	45,778	213,279	275,334 (14.2%)	38,027 (1.9%)	238,657 (12.1%)	266,589 (13.6%)	7,164 (0.4%)	438,421 (22.3%)	2,100,887 (100%)	506,238 (268)
Total	156	359,350 (27.2%)	6,990	174,502	98,578	280,071 (21.5%)	78,481 (6.0%)	184,452 (14.0%)	170,706 (13.0%)	9,531 (0.7%)	292,206 (22.2%)	1,374,797 (100%)	321,966 (170)

Source: Survey by authors in June–July 2013.

Note: 1 US\$=928.5 Kyat in 2013 (Central Bank of Myanmar).

3. The Structure of Income Earnings of Palm Climbers

3.1 *Toddy Palm Tapping Practices*

Toddy palm (*Borassus flabellifer*) is grown in upland dry areas with an annual rainfall of less than 1,000 mm. They are usually planted along embankments to break the wind and to mark the boundary between two upland fields. The palm trees are usually owned by either of the owners of the two fields. The climbers are usually landless, who rent the trees from the owner-cum-farmers and the rent is usually paid from a share of the jaggery produced.

The climbers (adult males) climb the trees with a wooden ladder twice a day—early morning and afternoon—to collect sap. The sap is then boiled in a large iron pan by the climber's wife (and daughters). After the sap thickens, it is cooled and rolled by hand into round edible pieces. Firewood or palm leaves have to be collected or purchased for boiling the sap. The sap is also used to make other products, such as fresh juice (sweet toddy—*htan yay cho*), fermented drinks (toddy wine—*htan yay arak*), and syrup (*htan yay*), albeit in small amounts.

The tapping season runs for seven months, from January to July.¹⁹⁾ There are three production seasons: the sap is collected from male florescence during January–February, from both male and female florescence from March–May, and finally from female florescence during June–July.²⁰⁾ The peak harvest season is from March to May; the climbers often hire additional laborers during peak season. In contrast, the families have to find other jobs during the lean season from August to December, such as casual agricultural labor.

As mentioned, the traders who purchase jaggery are the major credit providers to the climbers. They are mainly large-scale farmers living in the same village.

3.2 *Production Cost of Jaggery and Income of Palm Climbers*

Now, let us estimate the production cost of jaggery and income of the climbers. All the 99 climbers in the village were covered by the survey in September 2015. The climbers are classified into three categories—small-, medium-, and large-scale by the size of their business (i.e. jaggery production in the 2015 season) (see Table 4).

The table demonstrates that the size of the business depends mainly on the number of tapped palm trees.²¹⁾ On the contrary, almost no differences are observed among the three categories of

19) Harvesting is extended until August if there was a good monsoon in the previous year and/or if there was no rain that August. In poor harvest years (when the monsoon in the previous year was very poor), harvesting is confined to the three months from March to May.

20) See Mizuno [2015] for more detailed information.

Table 4. Classification of Palm Climbers

Category of climbers	Production of jaggery (viss/year)	No. of HHs		Years of working as climbers			Characteristics of Head of HH			No. of HH labor forces			No. of tapped palm trees per HH	
		Total	HHs with farmland	Total	Years with the present owner	Age (yr)	Education (yr)	Male	Female	Total	2014	2015		
Small	Less than 1500	21	2	20.4	15.8	47.2	4.4	1.76	1.38	3.14	45	32		
Medium	1500–3000	47	1	21.6	16.8	48.0	4.4	1.70	1.70	3.40	52	48		
Large	3000 and more	31	0	22.3	18.1	46.4	4.4	1.55	1.58	3.13	70	60		
Total/Average		99	3	21.6	17.0	47.3	4.4	1.67	1.59	3.26	56	48		

Source: Survey by authors in September 2015.

Note: 1 viss=1.6 kg.

Table 5. Estimates of Income from Jaggery Production

Category of climbers	No. of tapped palm trees	Total jaggery production (viss)	Productivity (viss/tree)	Net jaggery production after paying rent (viss)	Sales price of jaggery (Kyat/viss)	Cost of jaggery production per viss (Kyat/viss)	Net income per viss (Kyat/viss)	Total net income per HH (Kyat)
Small (N=21)	32	1,166	36.4	875	796	137	659	576,296
Medium (N=47)	48	2,376	49.5	1,782	813	116	697	1,242,054
Large (N=31)	60	4,037	67.3	3,028	822	63	759	2,298,062
Total (N=99)	48	2,639	55.0	1,980	812	104	708	1,431,502

Source: Survey by authors in September 2015.

Note: Palm tree owner received one-fourth of jaggery as rent.

climbers on basic socio-economic indicators, such as number of years spent working as climbers, age of household head, number of family labor, and so on. On average, the household heads of the climbers are 47 years old and have worked as climbers for 22 years. Their average schooling period is less than five years. In almost all cases, they have inherited their fathers' jobs and tapped 48 palm trees in 2015 on average.²²⁾

Table 5 summarizes the structure of earnings from jaggery production. In the village, the rent paid is one-fourth of the jaggery produced.²³⁾ Normally, climbers keep the first three days' jaggery and pay the fourth day's product as rent.²⁴⁾

The table demonstrates that there is a significant difference among the three categories of climbers, in the productivity of jaggery per tree and cost of production of jaggery per viss (=1.6 kg). There is also a difference in the sale price of jaggery per viss, albeit relatively small. As a result of these three differences, the difference in the earnings among the three categories becomes much more than the difference in the number of tapped palm trees.

The difference in jaggery production per tree comes from a combination of natural factors and skill of the climbers. Skillful climbers can choose highly-productive trees by determining which trees are tapped in a particular year, based on their experience.

On the other hand, the cost of jaggery production is composed of hired labor (laborers come from the same village and surrounding villages)²⁵⁾ and material inputs, such as pots (for collecting sap), rope (for tying the pots), pans (for boiling sap), and fuelwood. On average, 23% of the total cost is spent on hired labor and 77% on material inputs. The cost of fuelwood is by far the highest among the material inputs. The major reason for the difference comes from the cost of fuelwood. Climbers with a larger size of business can save on the unit cost of fuelwood because of economies of scale.

Finally, the relatively small difference observed in the sale price of jaggery seems to be derived from the bargaining power vis-à-vis the jaggery traders.

21) There is a large disparity among the climbers in the number of tapped trees, although their major socio-economic characteristics are almost the same. The number of tapped trees is mainly determined by two main factors: 1) the age and location of palm trees and 2) the capacity and skill of the climbers. Although some climber households have more than two adult males engaged in jaggery production, no relation is observed between the number of such adult males and the number of tapped palm trees. It seems that basically only one adult male climbs the trees.

22) It declined from 56 in 2014 because of the drought in 2014, which adversely affected sap yield in 2015.

23) During the British colonial period, the normal rent was one-third [Mizuno 2015: 53].

24) Interestingly, it is reported that if harvesting is impossible on the fourth day due to heavy rain or some other unavoidable reason, rent is not paid to the owners as a local custom.

25) When we evaluate the contribution of jaggery production industry to employment creation and income generation as presented earlier, the labor hired by the climbers also needs to be added.

4. The Interlinked Credit Transactions between Climbers and Traders

4.1 Salient Features of the Traders

To get more detailed information on the interlinked credit transactions between the climbers and jaggery traders, we conducted another survey on all the traders (N=20) living in the village in December 2015. Table 6 shows a list of the traders.

The traders' marketed amount of jaggery is the sum of what is purchased from producers (climbers and rent receivers) and given as rent, because some of them rent out their own palm trees. Normally, traders have regular suppliers of jaggery. However, some small-scale traders do not have such regular suppliers and they purchase jaggery from anyone who wants to sell occasionally.

Of the 20 traders, 4 are from landless households; while 4, 4, and 8 are from small-, medium-,

Table 6. List of Jaggery Traders in the Village

Trader	Total marketing amount of jaggery (viss) (a)+(b)	Owned farmland (acres)	No. of palm trees owned (harvested)	Jaggery received as rent (viss) (a)	Jaggery purchased (viss) (b)	No. of regular suppliers (climbers)	No. of climbers to whom loans were given	Grocery shop
A	2,000	0			2,000	3	0	owned
B	2,000	0			2,000	3	3	
C	2,000	0.5			2,000	3*	3	owned
D	2,078	1	5	78	2,000	*	3	owned
E	2,160	6	100	1,560	600	*	7	owned
F	3,000	0			3,000	5	4	owned
G	6,340	15	150	2,340	4,000	5	5	owned
H	7,500	5			7,500	15	15	owned
I	7,800	15	200	3,120	4,680	5	5	owned
J	8,020	17	200	3,120	4,900	5	5	
K	8,780	8	50	780	8,000	9	9	
L	9,120	25	200	3,120	6,000	7	5	owned
M	10,000	4			10,000	8	8	owned
N	10,424	23	540	8,424	2,000	6	4	owned
O	10,780	3	50	780	10,000	5	5	
P	11,872	15	120	1,872	10,000	5	5	owned
Q	13,560	15	100	1,560	12,000	25	25	owned
R	18,000	0			18,000	7	7	owned
S	19,528	13	130	2,028	17,500	11	9	owned
T	20,780	5	50	780	20,000	7	5	owned

Source: Survey by authors in December 2015.

Note: * means traders with irregular suppliers. Trader C had 3 regular suppliers besides several irregular suppliers.

Traders with more than 5,000 viss marketed jaggery are classified as large-scale traders.

Table 7. Socio-economic Characteristics of Jaggery Traders

Category of trader		No. of traders	Characteristics of Head of HH			No. of HH members	No. of family members working as trader
Type	Marketing amount of jaggery (viss)		Age	Education (yr)	Working experience as traders (yr)		
Small	5,000 or less	6	45.7	8.0	10.7	4.50	1.0
Large	5,001 or more	14	52.5	9.6	12.4	4.29	1.5
Total/Average		20	50.5	9.1	11.9	4.35	1.4

Source: Survey by authors in December 2015.

and large-scale farm households, respectively. We classified the traders into small and large based on the marketed amount of jaggery (using 5,000 viss per season as the criteria). Among the large-scale traders, the share of large-scale farm households is very high (57.1%). Note that most of the traders (80%) also own grocery shops in the village.

Table 7 shows the socio-economic characteristics of the traders. Their average age is 51 years, slightly more than that of the climbers (47 years). They have worked as jaggery traders for 12 years on average, less than the climbers (22 years). They are much more educated (an average of 9.1 years of education) than the climbers (4.4 years).

4.2 Nature of Credit from Traders to Climbers

Table 8 shows the loans provided by the traders to the climbers in 2014–15. All the traders except one provided loans to an average of seven climbers per trader. In the case of large-scale traders, the average amount of loans per climber is over 160,000 kyat, implying that their total loan amount reached about 1.3 million kyat on average. In the case of small-scale traders, the total loan amount is a little more than 150,000 kyat: one-eighth of the large-scale traders' loan amount.

Regarding the timing of loan disbursement, 46% of the loans are given during the lean season, from August to December. This means that the loans are used mainly for consumption purposes. In fact, many loans are provided during October, when the Thadingyut²⁶) Pagoda Festival is celebrated in Nyaung-U. The climbers' families attend the festival and spend a lot of money on food and entertainment. The remaining 28% is provided during the early harvest season, from January to February, when the climbers need to purchase material inputs for their work.

The traders with regular suppliers usually provide loans either during the lean season or early harvest season. In either case, the climbers must sell all their jaggery to that trader. Selling to other traders is very difficult because the traders regularly exchange information among themselves about

26) Thadingyut is the seventh month of the traditional Myanmar calendar when the Buddhist Lent ends. During the Buddhist Lent (3 months before Thadingyut), the Buddhist monks are prohibited from traveling.

Table 8. Loans from Traders to Climbers

Category of trader	No. of traders	Provision of loan		Timing of loan provision (% of total loan provision in 2014/15)			Average amount of loan provided per climber (Kyat)
		No. of traders provided loan to climbers	Average number of climbers with credit relation per trader	Lean season (Aug–Dec)	Early harvest season (Jan–Feb)	Whenever requested	
Small (N=6)	6	5	4	15.6	10.4	74.0	38,440
Large (N=14)	14	14	8	57.1	33.7	9.1	163,054
Total/Average	20	19	6.9	46.2	27.6	26.2	130,261

Source: Survey by authors in December 2015.

the sales and purchases of jaggery. However, when climbers need additional credit for emergencies, the traders who had provided them with consumption credit earlier often refuse their request. They provide additional loan only when they are convinced of the repayment capacity of the climbers (note that no climber household borrowed more than 250,000 kyat from the jaggery traders in emergencies, according to the data collected in 2013). Hence, the climbers have to approach other traders, who do not have regular suppliers, for credit and secretly sell jaggery to them by breaking the rule. As the size of the loans from the traders without regular suppliers is small, on an average of less than 40,000 kyat (see Table 8), the climbers are able to repay.

Table 9 is a summary of loan recovery. As mentioned, no interest is charged for the loans. Almost all the loans made by large-scale traders are collected during the peak harvest season (March–May), in contrast with the high percentage (44.9%) of loans collected during the late harvesting season (June–July) by small-scale traders because the latter provide more loans “whenever palm climbers ask for financial assistance” (74% of total), as shown in Table 8.

The repayments are made as follows. If the traders have their own grocery shops, the climbers buy necessary foodstuff (such as rice and edible oil) and other daily necessities from the shop when they sell their jaggery and repay the loan with the balance.²⁷⁾ For traders without own grocery shops, the climbers repay the loan with a one-day harvest while retaining the remaining two-day harvest for their household expenditure.²⁸⁾

Table 9 also shows the outstanding loan amounts in August 2014 and 2015, just after the jaggery production season, indicating the amount of “perpetual” loans taken by the climbers apart from the loans newly borrowed during 2014–15. It is not known how the perpetual loans accumulated, but in this year, the traders collected only the loans provided during 2014–15.

27) Sometimes the balance would be negative. In such a case, the debt owed to the traders increases temporarily.

28) The remaining one-day harvest goes to the palm tree owner.

Table 9. Collection of Loan Repayment by Traders

Category of trader	Timing of repayment collection			Outstanding loan amount per climber (Kyat)	
	(% of repayment collection in 2015)			August 2014	August 2015
	Early harvest season	Peak harvest season	Late harvest season		
Small (N=6)	0.4	54.6	44.9	53,815	50,315
Large (N=14)	6.3	84.0	9.7	254,905	254,905
Average	4.5	75.2	20.3	194,578	193,528

Source: Survey by authors in December 2015.

Note: Early harvest from January–February; Peak harvest from March–May; Late harvest from June–July.

Now, let us estimate the implicit interest rate of the interlinked credit transactions. As mentioned, the traders are compensated for their interest-free loan by the lower purchase price of jaggery. The key is the difference between the market price and the actual price offered. The climbers reported that the difference between their sale price to the large-scale traders and the market price is 100 kyat/viss.²⁹⁾ We also collected purchase price data of jaggery from all 20 traders and found that the small-scale traders offer higher prices than the large-scale ones, roughly 80 kyat/viss. Hence, we assume that the large-scale traders offer a price of 100 kyat/viss lower than the market prices, whereas the difference is 20 kyat/viss in the case of small-scale traders. Table 10 shows that the estimated interest rate is 1.5% and 3.4% per month for small- and large-scale traders, respectively.

In October 2017, an interview was conducted with a “very big” trader in the locality (a little distance from the study village), who clarified that loans are provided by such “very big” traders to the large-scale traders in the study village. There are four other such “very big” jaggery traders in the locality with the same scale of business.

The big trader we interviewed had worked as a jaggery trader for 15 years. When he started the business, he sold 13 acres of farmland (of a total of 20 acres) to raise funds. At the time of the survey, he sold around 500,000 viss of jaggery per year. The major destinations (wholesale market) are Yangon (350,000 viss) and Mandalay (150,000 viss).³⁰⁾ He collects jaggery from 15 palm climbers and two traders from his own village, in addition to four traders from four nearby villages.

He provides loans to two traders (from his own village) and four traders (from different villages), at an amount of 1.5 million kyat and 500,000 kyat per person, respectively. The loan is usually provided during January to November without charging explicit interest, which is compensated for

29) We also asked the same question to the large-scale traders and obtained an answer of 50 kyat/viss. But we regard their answer as underreported.

30) One truck can transport 10,000 viss of jaggery at a time.

Table 10. Estimates of Implicit Interest Rates

	Small-scale traders	Large-scale traders
Perpetual loan (Kyat/climber)	52,000	255,000
New loan in 2014/2015 (Kyat/climber)	38,000	163,000
Time of loan provision		
Early harvest (Jan.)	75%	10%
Late harvest (Oct.)	10%	35%
Whenever requested (Oct.)	15%	55%
Time of loan recovery		
Early harvest (Feb.)	—	5%
Peak harvest (Apr.)	55%	85%
Late harvest (Oct.)	45%	10%
Purchased jaggery (viss/climber)	650	1,300
Difference with market price (Kyat/viss)	20	100
Implicit interest (Kyat)	13,000	130,000
Estimated interest rate (% per month)	1.5%	3.4%

Source: Prepared by authors.

Note: The month in the parenthesis show the assumed average month in which loans were provided or repaid.

by the lower purchase price of jaggery. The loan is mainly used by the traders for purchasing jaggery as working capital. However, it is highly plausible that at least a part of the loan is further passed on to the palm climbers.

5. The Structure of the Financial Market in the Village

5.1 Overview of the Financial Market in the Village

How can the interlinked credit transactions between palm climbers and jaggery traders be positioned in the whole financial market of the village? Table 11 summarizes the borrowings of the 156 sample households in 2013. In the case of loans from informal sources, the figures show the number of households that have outstanding debt at the time of the survey.

The table shows that the maximum number of indebted households are landless (78.7%), followed by small-scale farm households (53.1%), and medium-scale farm households (43.8%). The other important points with regard to the informal financial markets are: 1) the landless households and small-scale farm households are highly dependent on informal credit and 2) it seems that both the large- and medium-scale farm households are net lenders rather than net borrowers in the informal market, although we have no data to show it.

Considering that the informal sources, PGMF, and the Ministry of Cooperatives are the three major credit sources available in the village, especially for the landless households and small-scale

Table 11. Borrowers and Source of Borrowings

Type of households	No. of HHs	No. of HHs with debt	%	No. of HHs borrowed from;						
				Formal sources			PGMF	VRF	Informal sources	
				MADB	Ministry of Cooperatives	Gov. office				
Landless HHs	Palm climbers	37	30	81.1%		10		17	5	24
	Others	52	40	76.9%		13		23	3	22
	Sub-total	89	70	78.7%		23		40	8	46
Farm HHs	Less than 5 acres	32	17	53.1%	2	7		5		11
	5–10 acres	16	7	43.8%	2	2		1		2
	10 acres and more	19	5	26.3%	1	2	1			3
	Sub-total	67	29	43.3%	5	11	1	6		16
Total		156	99	63.5%	5	34	1	46	8	62

Source: Survey by authors in June–July 2013.

Note: VRF means various village revolving funds.

In case of PGMF, the number shows the number of members, not loans. But normally, a member can borrow once in a year.

farm households,³¹⁾ let us examine these sources one by one.

Ministry of Cooperatives: The Ministry of Cooperatives started a loan program in the village in February 2013, targeting the poor, whereby 34 households (21.8%) borrowed 50,000 kyat for a year at 2.5% monthly interest rate. Due to the small size of the loan and the way it was disbursed (“suddenly disbursed like a gift” just 4–5 months before the survey³²⁾), borrowers used the money for various purposes: consumption and medical expenses (49.0%), production purposes, such as agriculture, livestock (pig raising), and small business (27.9%), education, debt repayment, and so on. **PGMF:** PGMF, a major international microfinance institution (MFI) based in the US, started their program in the village in 2005. The number of members gradually increased from 21 in 2007 to

31) Loans from Myanmar Agricultural Development Bank (MADB) are not popular in the village because of a lack of rice cultivation. Only five farmers (7.5%) borrowed from MADB (200,000 kyat by two farmers and 140,000 kyat by three farmers at an interest rate of 8.5% per annum). In the Village Revolving Funds (VRF), donations are collected from villagers for various purposes, such as education, health, drinking water, electricity, and religion (Buddhism), and the funds are managed by committees organized for each purpose. The money is lent with interest to any villager who wants to borrow. In the study village, loans from various VRFs were provided at 2.5 to 5% monthly interest rates. The loans were very small, at 5,000 to 50,000 kyat per person. On the VRF, see Chapter 4 (written by Ikuko Okamoto) of Fujita *et al.* eds. [2015].

32) However, if borrowers fully repay after a year, they can receive a new one-year loan.

46 in 2013 (see Table 12).³³⁾ We found that the PGMF program is well targeted to the poor; of the 46 members in 2013, 40 (87.0%) are landless households and 5 (10.9%) are small-scale farm households. Loans are provided for a year, and repayment is collected every two weeks at 2.5% monthly interest rate.³⁴⁾ Borrowers who repay fully can get another, larger one-year loan in the next year; thus, the loan size increases year by year but usually does not exceed 200,000–300,000 kyat. Table 12 indicates that in 2012, the size of the loan from PGMF ranged from 100,000 to 200,000 kyat in many cases. Borrowers used the loans for various purposes, such as production purposes (agriculture, jaggery production, livestock, and small business—44.4%), consumption and medical expenses (35.6%), education (9.8%), debt repayment (4.3%), house construction, and so on (see Table 13). Compared to the utilization of loans from the Ministry of Cooperatives, the proportion of production purposes is substantially higher. Special attention should be paid to the fact that many landless palm climbers used the loan from PGMF for pig raising, which might become an important additional income source for them.

Informal sources: Tables 14 and 15 show the distribution of size and interest rate for loans from informal sources, including loans from jaggery traders (to palm climbers). The major points from the two tables can be summarized below.

First, the size of loans ranges from less than 50,000 kyat to more than 2 million kyat, but a loan amount between 100,000–500,000 is the most frequent case, especially when jaggery traders are the lenders. Compared to the informal loans, the loans from the Ministry of Cooperatives are small, and we can say the same about the loans from PGMF to some extent.

Second, with regard to the interest rate charged: 1) moneylenders and pawn shops charged the maximum interest rates (they charged a lower 4 to 5% monthly interest rate when customers deposited gold or other valuables as collateral), 2) “villagers,” “farmers,” and “employers”³⁵⁾ also usually charged very high interest rates, 3) “relatives” and “friends” provided either interest-free loans or loans at relatively high interest rates.³⁶⁾

Third, in this interest rate spectrum, it is notable that the jaggery traders charged relatively low

33) The number of members here is only from the 156 sample households. The number for the entire village is much larger.

34) Until January 2015, when the MFI regulation on interest rates changed, PGMF charged an effective interest rate of 5% per month because they charged 2.5% interest on the original loan amount until the last installment, though the principal amount decreased over time.

35) The “villagers,” “farmers,” and “employers” categorization is based on the respondents’ replies. It seems that “villagers” and “farmers” are interchangeable, but “employers” are mentioned by agricultural laborers who are usually hired by specific farmers.

36) Relatives charged particularly high interest rates for loans intended for international migration.

Table 12. Members and Loans Disbursed by PGMF

No. of new members joined	No. of members quitted	No. of accumulated members	No. of disbursed loans	Loan size (Kyat)																	
				20,000–35,000	40,000–50,000	60,000–70,000	80,000–100,000	100,000–150,000	120,000–150,000	200,000–300,000	300,000–N.A.										
2005	1	1	1																		
2006	7	8	8	4	3	1															
2007	13	21	21	11	4	6															
2008	8	27	26	4	2	11	3	6													
2009	9	35	34	3	3	6	2	13	6	1											
2010	6	39	39		3	1	4	4	15	10	2										
2011	4	42	42	2	2	1	4	2	4	14	12	3									
2012	3	43	42		7	1	1	9	10	12	2										
2013	3	46	32	1	6	2	1	11	1	5	4	1									
Total	54	8	46	245	23	18	25	27	28	27	45	25	20	6	1						
				100.0%	9.4%	7.3%	10.2%	11.0%	11.4%	11.0%	18.4%	10.2%	8.2%	2.4%	0.4%						

Source: Survey by authors in June–July 2013.

Table 13. Utilization of Loans from PGMF during 2005–2013

No. of member HHs	No. of loans	Utilization (%)										
		Agri.	Jaggery	Livestock	Business	Education	House construction	Repayment	Consumption	Medical expenses	Unknown	
Landless palm climbers	17	99	—	6.6	31.3	5.1	11.6	2.5	6.1	23.7	11.1	2.0
Other landless	23	117	—	—	14.2	25.4	10.7	2.6	3.0	24.8	14.2	5.1
Farmers	6	29	17.2	—	12.1	39.7	0	3.4	3.4	17.2	6.9	0
Total	104	245	2.0	2.7	20.9	18.8	9.8	2.7	4.3	23.5	12.1	3.3

Source: Survey by authors in June–July 2013.

Table 14. Size of Loans by Informal Lenders

Amount (Kyat)	No. of loans	%	Informal lender							
			Relatives/ Friends	Villagers/ Farmers	Employers	Palm owners	Car owners	Jaggery traders	Moneylenders/ Pawn shops	
-49,999	5	7.6%		2			1		1	1
50,000-99,999	8	12.1%	2	3	1				1	1
100,000-249,999	28	42.4%	4	5	2	1			12	4
250,000-499,999	13	19.7%	1	3					7	2
500,000-999,999	4	6.1%	2	1	1					
1,000,000-1,999,999	7	10.6%	2	2					1	2
2,000,000-	1	1.5%								1
Total	66	100.0%	11	16	4	1	1	1	22	11

Source: Survey by authors in June-July 2013.

Table 15. Interest Rates Charged by Informal Lenders

Interest rate (%/month)	No. of transactions	%	Lender							
			Relatives/ Friends	Villagers/ Farmers	Employers	Palm owners	Car owners	Jaggery traders	Moneylenders/ Pawn shops	
0	8	12.1%	3	3			1		1	
2	1	1.5%		1						
3-4	20	30.3%							20	
4	1	1.5%								1
4.6	1	1.5%	1							
5	10	15.2%	4	3					1	2
6	4	6.1%	2	1	1					
7	7	10.6%	1	3						3
8	4	6.1%		2	2					4
10	7	10.6%		2	1					1
NA	3	4.5%		1				1		1
Total	66	100.0%	11	16	4	1	1	1	22	11

Source: Survey by authors in June-July 2013.

Note: 1) The interest rate of 3.4% per month for the credit from jaggery traders is based on our estimate.
 2) The interest rate of 4.6% per month is a combination of 4 to 5% from relatives.

interest rates: 3.4% per month by large-scale traders and 1.5% per month by small-scale traders, according to our estimates.³⁷⁾ We also need to consider the extra profits obtained by the traders who own grocery shops when they sell foodstuff and other necessities to the climbers on a regular basis, however.³⁸⁾

Fourth, if we compare the interest rates charged by MADB, the Ministry of Cooperatives, and PGMF with those charged by informal lenders, it is evident that their rates are very low in general.³⁹⁾ This explains why borrowers try to repay the loans from the three financial institutions as much as possible, even if they have to borrow money temporarily from elsewhere for repayment.

In the survey conducted in 2013 for 156 sample households, one question was whether the household faced any “emergencies” in the last five years and if so, what was the emergency, how much was the expense, and how they managed the necessary expenses.

The major findings from the analysis of this data are summarized below.

First, a high proportion of farm households faced emergencies that needed more than 500,000 kyat, whereas in the case of landless households, even after including emergencies that required 250,000–500,000 kyat, very few households faced such emergencies.⁴⁰⁾ In addition, as mentioned already, there was not a single case where the landless climber households obtained loans of more than 250,000 kyat from jaggery traders for emergencies.

It can be inferred that the landless households are too poor to borrow “big” money for emergencies. In fact, it is plausible that they try to “save” on money spent on social ceremonies and give up opportunities, like higher education of children, expensive medical treatment, and so on. In such a situation, even the jaggery traders do not provide additional loans for emergencies for fear of non-repayment.

Second, when landless households borrow for emergencies, the amount is relatively small and the major purpose is “consumption” (including medical expenses).

37) Several of the traders interviewed claimed that, because of the labor shortage due to the availability of job opportunities outside the village, they are obliged to provide new loans to climbers despite non-repayment of the perpetual loans. They also mentioned that they are obliged to provide new loans at relatively favorable terms and conditions to maintain good relationships with the climbers and smooth jaggery trade operations.

38) According to the village head (interviewed in October 2017), who owns a grocery shop, when they sell foodstuff, their profit is 15–20% of the sales.

39) The effective interest rate on loans from PGMF was 5% per month, as mentioned in footnote 34). Due to the frequent repayment system adopted by PGMF, borrowers failed to notice the true interest rate.

40) The percentage of households that faced emergencies that needed more than 500,000 kyat are: 47.4%, 37.5%, and 31.3% for large-, medium- and small-scale farm households, respectively, but the same percentages, even after including emergencies that needed 250,000–500,000 kyat, are: 21.6% and 19.2% for landless climbers and non-climbers, respectively.

Third, some landless households, especially non-climber households, do make big “investments,” especially for international migration and (higher) education.

5.2 Discussion

There are two types of landless households in the study village: palm climbers and non-climbers. In spite of the difference in their major occupation, the estimated per capita income in 2012 is almost the same (about 190,000 kyat), which is a little more than 800,000 kyat per household on average (see Table 3). Income distribution in the village is highly skewed and the difference with the richest households is nearly five times in terms of per capita income.

It seems that, traditionally, the two types of landless households depended on the rich households for their livelihood, through work opportunities either as hired agricultural labor or palm tree tenant. However, as shown in Table 3, the extent of dependence of non-climber households has decreased sharply because of the availability of other job opportunities both inside and outside the village. These job opportunities could be the reason for some of the former palm climbers giving up their traditional jobs, resulting in the reduced number of palm climbers.

However, their living standard still remains near the minimum subsistence level and they need to borrow money almost regularly for consumption purposes including medical expenses and others, at high interest rates of over 5% per month. It can be inferred that such dependence on usurious moneylending makes it more difficult for them to escape poverty.

There are some opportunities for them to “invest,” however, such as international migration and education. Some landless households have already started to make such investments, even by borrowing at high interest rates.

The other relatively small investment opportunity lies in the livestock sector. Some of the loans from PGMF are utilized for pig raising, especially by climber households. In contrast, non-farm business is a major investment opportunity for non-climber households (see Table 13).

In such a livelihood structure of landless households, the interlinked credit from jaggery traders (many of them large-scale farmers) functions to ensure minimum subsistence of the climbers because of the nature of credit utilization and the way it is disbursed and repaid. However, borrowing from traders without regular suppliers during emergencies (though the loan amount is small) plays a supplementing role in ensuring minimum subsistence.

Interlinked credit has persisted in spite of PGMF's microfinance program because PGMF grants loans only once a year during a pre-determined season, and given the strict repayment schedule, borrowers prefer to use the loan amount for production purposes as much as possible. By contrast, the interlinked credit from jaggery traders is much more flexible in terms of both loan disbursement

and its repayment, and above all, the credit is mainly for consumption purposes and the interest rate is low and implicitly charged.

6. Concluding Remarks

This study focuses on the livelihood of the landless palm climbers in Myanmar's Central Dry Zone. Their number has rapidly decreased in recent years because of the reluctance of climbers' sons to succeed their fathers' job and the sluggish demand growth for jaggery. However, there are some areas where jaggery production industry is still active. The Nyaung-U Township is one such area and we selected a study village from the township and conducted a series of detailed surveys during 2013–2017.

Our major findings are as follows. First, a strong labor absorption power of the jaggery production industry is confirmed in the study village: 21.5% of the total income is derived from jaggery production, which is close to the income from crop production (27.2%). The industry provides major employment to 41.6% of landless households, partial employment to 16.4% farm households, and rent income to 59.7% farm households. If the contribution of jaggery trading sector is added, these figures become even higher.

Though it is not possible to generalize with the limited data, we can conclude that the data strongly supports the hypothesis that the high labor absorptive power of the jaggery production industry has historically helped many landless households to survive in the CDZ, at least in part.

Second, we demonstrate how the landless palm climbers make a living, by examining their special credit relations with jaggery traders, most of whom are large-scale farmers in the same village. We conclude that the jaggery traders ensure minimum subsistence of the climbers because the credit is usually extended during lean season for consumption purposes and repaid throughout the next jaggery production season when the climbers sell jaggery to the traders and the traders allow them to keep some money for daily necessities at the time of repayment. Moreover, the interest implicitly charged by the jaggery traders is estimated at 3.4% per month (in the case of large-scale traders), much lower than the rates in the informal financial market.

It can be said that the relation between the jaggery traders and landless palm climbers is a kind of patron-client relation, where the former gets a stable supply of jaggery (and also stable profits from their grocery shops) while the latter is guaranteed a livelihood of minimum subsistence. However, when the climbers (who have already borrowed their usual credit) need additional credit for emergencies, the traders often refuse unless they are convinced of the repayment capacity of the climbers. In other words, the jaggery traders do not extend loans to climbers beyond a certain amount. This is a

limitation of the patron-client relation between the two.

The availability of borrowing opportunities from jaggery traders without regular suppliers during emergencies, albeit for small loan sizes, seems to play a supplementing role in ensuring a minimum subsistence level for the climbers, to some extent.

Third, it is found that the special credit relations between the two parties has persisted, in spite of the existence of a microfinance program by PGMF. In fact, more than half of the indebted palm climber households have become its members and borrow almost every year. The size of loan ranges from 100,000–200,000 kyat. However, the loan is disbursed only once a year during a pre-determined season. The borrowers also need to follow a strict repayment schedule, every two weeks. Due to the inflexible nature of the microfinance program, borrowers try to use the loan for production purposes as much as possible for avoiding risk.

Considering the significant difference between the loans from jaggery traders and the loans from PGMF, it is quite natural for the two kinds of credit to coexist. The relation between the two loans is complementary rather than competitive; the loans from the jaggery traders are used mainly for consumption purposes whereas the loans from PGMF are used more for production purpose such as pig raising.

The jaggery production industry in the CDZ has been declining rapidly. It is uncertain whether this trend will monotonously continue because there is a possibility of a reverse movement—being affected by the market prices of jaggery. In fact, according to the information we obtained from a “very big” jaggery trader, the purchase price of jaggery increased sharply from 2012–14 and again from 2015–17 (see Table 16). According to the trader, this was because of a scarcity of jaggery in the market due to a rapid decline in production in the past several years. Due to this surge in jaggery

Table 16. Movement of Jaggery Price in Nyaung-U Township

	Price of jaggery (Kyat/viss)
2011	350–400
2012	500
2013	750–800
2014	1,000–1,100
2015	1,000–1,100
2016	1,300
2017	1,500–1,550

Source: Survey by authors.

Note: Purchased price by a large-scale trader nearby the study village, interviewed in October 2017.

prices, the head of our study village (a large-scale jaggery trader) reported that many climbers repaid their perpetual loans, in addition to the usual loans taken every year.

Nevertheless, the supply-side factor (i.e., the reluctance of the present generation to continue with the traditional palm climbing job, which is becoming increasingly unattractive over the “smart” and more remunerative non-agricultural jobs in cities and abroad) will cause a decline in the jaggery production industry in the long run. Our data showing more “very young” household heads in their 20s among the non-climber households (than the climber households) supports this point. Therefore, in the long run, it is plausible that more of the younger members in the climber households will join the group of non-climber households.

The non-climber landless households, who have already quit, make their living mainly by remittances, non-agricultural wages, and non-farm business income in the village (see Table 3). In this sense, migration is the most important survival strategy for them. Note also that only 23% of the labor force are migrants working abroad (Malaysia) while the remaining 77% stay in cities in Myanmar among the landless non-climber households. Their future now depends on the progress of industrialization in Myanmar and on getting more stable and high-income earning jobs.

Acknowledgements

The first visit and the first survey was done as a part of ‘Economic Support Program’ of Japan International Cooperation Association (JICA). The second and third survey was supported by JSPS KAKENHI Grant Number 15F15095 (FY 2015-17). Authors would like to show gratitude for the support of the Ministry of Agriculture, Livestock and Irrigation of Myanmar and the villagers of Chaung Shee village. We would also like to thank Editage (www.editage.com) for English language editing.

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