Sustainable Agriculture in Rural Indonesia

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III-6 Efficiency of Rice Distribution between Margokaton Village and Yogyakarta

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1. Introduction

The Indonesian rice market is undergoing a process of transition towards market liberalization, globalization and decentralization. The implementation of AFTA (Asean Free Trade Area), APEC (Asia Pacific Economic Cooperation) and WTO (World Trade Organization) will become new challenges for Indonesia. AFTA will be implemented in this coming year 2003. Quantitative restrictions and non-tariff barriers will be abandoned and substituted by the Common Effective Preferential Tariff (CEPT).

However, the monetary crisis that occurred in 1997 and the January 1998 Letter of Intent (LOI) to the International Monetary Fund (IMF) has accelerated the government of Indonesia's deregulation of the agricultural sector. BULOG (Food Logistics Agency) was banned to monopolize rice imports by Presidential Decree No. 230/1998. Additionally, private companies were permitted to import rice and the rice market was fully liberalized. The loan from the Bank of Indonesia (BI) for rice procurement was also discontinued by Law No. 23/1998. Therefore, the domestic rice market became more competitive. Rice imports and the role of private importers increased tremendously. The share of rice imported by private traders increased from 19% in 1998 to 63% in 1999. To reduce rice imports, the government has been imposing import tariffs of 30% since January 2000.

Following the process of trade liberalization to integrate the domestic market into the world economy, the barriers of regional trade in Indonesia have tended to increase. Usman (2001) indicated that after the implementation of Law No. 22/1999 about "decentralization and regional autonomy"; and Law No. 25/1999 about "fiscal balance between the central government and the regions" on January, 1, 2001; each region improved her PAD (*Pendapatan Asli Daerah*) or local revenues by issuing PERDA (*Peraturan Daerah*) or local regulations regarding taxes, levies and other charges. Such phenomenon created a high cost economy, a disturbing business climate, weakened competition and impeded local economic development. At the national level, it reduced the efficiency and competitiveness of production. Therefore, Indonesia could not benefit from liberalizing the domestic market.

The question may arise as to what the impact is of the above policy changes

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to the efficiency of the rice market in Indonesia. Increasing rice imports cause domestic prices to decline. Consumers would be better off under liberalization because they have more choice for the consumption of rice in terms of quality and price. Oppositely, farmers tend to be worse off. Though the government still sets a floor price for rice before planting season, it is understood to be the purchasing price by the government, not as the protection price for farmers. Farm gate price is largely determined by market forces. The effect of trade liberalization is transmitted down to farm level through the market mechanism. The effect depends on the magnitude of the tariffs and the price elasticity.

The effect of trade liberalization on local traders and their distribution system is not yet clear. The rice market seems to be getting more competitive as the degree of commercialization also increases. Therefore, minimizing marketing costs becomes essential for traders to cope with liberalization and commercialization. Subsequently, it may affect various elements of marketing such as the type of transaction, mode of payment, and interlinkage transaction among traders.

With this background, it is necessary to study the magnitude of the liberalization impact on farmers and local traders. This study aims to analyze the efficiency of rice distribution in Seyegan Sub-district, Sleman, Yogyakarta by investigating marketing channels and institutions, business practices among traders, analysis of margin and degree of monopoly. It is hypothesized that the local rice market may become more competitive after the deregulation and liberalization of the market.

Primary and secondary data were used in this study. The primary data was collected directly by interviewing 94 random traders (Marketing and Distribution Survey in 2001 and 2002). The sampling frame of traders was constructed firstly based on information from the heads of hamlets and updated continuously after interviewing the traders. The interview was implemented by following the marketing channels, starting from Margokaton, a village of Seyegan. The primary data consists of educational backgrounds, business experience, trading scale, buying price, selling price, mode and timing of payment, marketing costs, working capital and credit ties among traders. Meanwhile secondary data consists of irrigation facilities, rice production, population, transportation and other infrastructures to indicate the accessibility of the study sites. The secondary data was collected from local government offices.

2. Overview of The Study Area

Seyegan Sub-district is one of 17 sub-districts of Sleman District, Yogyakarta Province (See in Table III-6-2). Geographically, Seyegan Sub-district lies at a height of 160 m above sea level, with average rainfall being about 2,500 mm per month. Seyegan Sub-district is bordered by 5 other sub-districts of Sleman District[1]. Administratively, Seyegan Sub-district consists of 5 villages (See in

Table III-6-1). This study started to follow the marketing channels from Margokaton Village, which was established in 1946 by the local regulation of Yogyakarta No: 16/1946. The village was a unification of three *kalurahan* (equivalent to hamlets), namely Susukan, Planggok and Bokong. Recently, the village consists of 12 hamlets[2]. The map of the study area can be seen in Figure III-6-1.

Agriculture is the most important sector in the study area. It contributes 33% of GDP (Gross Domestic Product) (Kecamatan Seyegan dalam Angka, 2000). From the Seyegan Sub-district, only Margokaton, Margodadi and Margoluwih

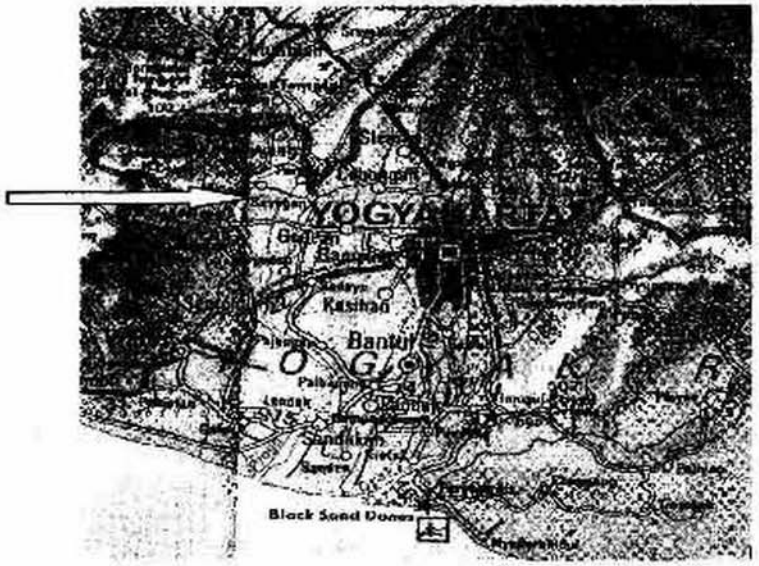


Figure III-6-1. Map of the study area

Table III-6-1 Production of agricultural commodities in Seyegan Sub-district in 2000 (ton)

Crop\Village	Margoluwih	Margodadi	Margomulyo	Margoagung	Margokaton	Total
Rice[a]	3,702	3,076	2,578	2,746	3,620	15,722
Corn	39	101	46	43	50	279
Peanut	23	46	32	44	32	177
Soybean	31	24	15	9	3	82
Cassava	44	371	306	284	350	1,355
Tobacco	–	–	–	–	–	49
String bean	45	135	150	275	125	730
Chilli	114	222	165	127	228	856
Mustard green	22	23	136	33	13	227

Note: [a]Un-milled rice (Paddy).
Source: Kantor Statistik dan BAPPEDA Sleman (2001).

Villages get their irrigation from Mataram Canal (*Selokan Mataram*)[3], the main irrigation source of Yogyakarta Province. Around two-thirds of the Margokaton area is irrigated by the canal. Therefore, the majority of farmers only cultivate rice, five or six times every two years. This cropping pattern has caused mice plagues to become the main problem in the study area due to the constant fertility cycle of mice. In order to overcome the problem and earn a higher income, some farmers have converted their rice fields into fishponds, especially for catfish or *gurameh* cultivation. Meanwhile one-third of the area of the Margokaton Village cannot be

Table III-6-2 Production and availability of rice in the study area in 2000

Village/Sub-district/District	Ah	Y	Qp	Qcp	Qcr	Pop	RA
Village level in 2000							
Margoluwih	639	57.93	3,702	3,332	2,098,879	8,122	258
Margodadi	531	57.93	3,076	2,768	1,744,139	7,980	219
Margomulyo	445	57.93	2,578	2,320	1,461,661	9,977	147
Margoagung	474	57.93	2,746	2,471	1,556,915	8,920	175
Margokaton	625	57.92	3,620	3,258	2,052,540	7,037	292
Sub-district level in 2000							
Moyudan	2,778	58.77	16,326	14,694	9,257,016	33,595	276
Minggir	2,995	58.83	17,620	15,858	9,990,305	34,562	289
Seyegan	2,714	57.94	15,725	14,152	8,916,027	42,151	212
Godean	2,955	58.13	17,177	15,460	9,739,594	57,245	170
Gamping	2,636	57.89	15,260	13,734	8,652,309	65,789	132
Mlati	2,172	60.31	13,099	11,789	7,427,321	67,037	111
Depok	1,012	57.39	5,808	5,227	3,293,061	109,092	30
Berbah	2,658	60.85	16,174	14,557	9,170,618	40,226	228
Prambanan	2,863	61.22	17,527	15,775	9,937,971	44,003	226
Kalasan	3,064	57.35	17,572	15,815	9,963,347	54,621	182
Ngemplak	3,363	60.45	20,329	18,296	11,526,733	44,382	260
Ngaglik	3,021	59.41	17,948	16,153	10,176,380	65,927	154
Sleman	2,755	61.18	16,855	15,170	9,556,836	55,549	172
Tempel	3,082	57.67	17,774	15,997	10,077,798	46,386	217
Turi	1,663	57.70	9,596	8,636	5,440,654	32,544	167
Pakem	2,452	56.06	13,746	12,371	7,793,932	30,713	254
Cangkringan	2,193	61.87	13,568	12,211	7,693,108	26,354	292
District level							
Sleman	44,376	59.00	262,104	235,894	148,613,011	850,176	175

Notes: Ah = harvested area (ha), Y = yield of paddy (quintal/ha), Qp = paddy production (ton), Qcp = paddy availability for consumption (ton), 90% of paddy production. This calculation based on the assumption that 10% of paddy production is used for seed and others, Qcr = milled rice availability for consumption (kg). Conversion factor of paddy to milled rice is 0.63, Pop = population (people), RA = rice availability (kg/capita/year).
Source: Kantor Statistik dan BAPPEDA Sleman (2001).

irrigated by the Mataram canal because the location is higher (on the north wall of the canal). Nevertheless some farmers along the canal use a diesel or pump machine to draw the water from the canal. Farmers in this area only cultivate rice in the rainy season. In dry season, the farmers cultivate *palawija*, such as: corn, peanuts, soybeans, cassava and tobacco; and vegetables, such as: string beans, chillies and mustard green. Table III-6-1 shows the production of agricultural commodities in the study area.

The local production of rice is sufficient to feed the people within the study area. Rice availability in Seyegan Sub-district and Margokaton Village in 2000 accounted for 212 kg/capita/year and 292 kg/capita/year respectively (Table III-6-2), above the national average of consumption per capita (133 kg/capita/year). The rice surplus available for sale outside of the study area is quite large. Rice trading is very important for the economy of the area. In the local markets, rice from the study area is known as *beras* Minggir (rice from Minggir) due its close proximity to the study area and Minggir Sub-district. People in the study area and Yogyakarta usually identify two names for local rice, *beras* Godean (rice from Godean) and *beras* Minggir. Most of the rice in the study area is IR 64 or C4.

Margokaton Village has good accessibility because it is located along the main route between Yogyakarta and Kebonagung. The village is located 3 km away from the center of Seyegan Sub-district (5 minutes by car), 9 km from the center of Sleman District (15 minutes) and 17 km from the city of Yogyakarta (30 minutes). Local markets are important for selling and for the distribution of agricultural produce in the study area. Most of them are opened once or twice every five days in accordance with the Javanese Calender. There are two important local markets, namely Ngino Market and Balangan Market. Ngino Market is located at Margoagung Village, 2 km to the north of Margokaton. Meanwhile Balangan Market is located in Sendangrejo Village, Minggir, 3 km to the west of Margokaton. Other local markets are Cebongan (5 km to the east), Godean (7 km to the south) and Tempel (8 km to the north).

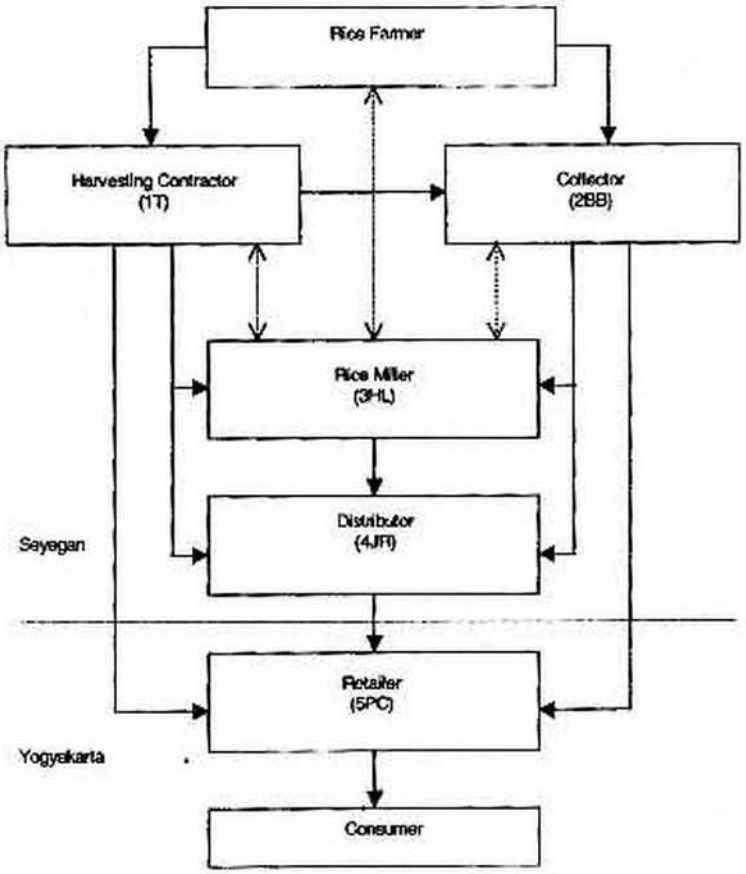
3. Rice Marketing Channel and Traders Characteristics

This section discusses the channel of rice marketing and the overview of trader characteristics which may affect their business practices and operation, such as business territory, status and mode of business, trading experience, endowments of facilities and means of transportation, and scale of trading.

3-1 Rice marketing channel

The channel of rice marketing in the study area is illustrated in Figure III-6-2. There are many players involved in the rice marketing between farmers and consumers. The study interviewed 94 traders which can be classified by their roles

into 5 groups, namely: (1) harvesting contractors (*penebas*/1T), (2) collectors (*penguyang*/2BB), (3) rice millers (*penggiling*/3HL), (4) large collectors or wholesalers (*pedagang besar*/4JR) and (5) retailers (*pengecer*/5PC).



<----> : The processing channel from paddy to rice.
----> : Trading channel.

Figure III-6-2 Rice marketing channels in the study area

3-1-1 Penebas

Penebas seek and purchase paddy directly from the farmers by way of *tebasan* institution. *Tebas* literally means to cut something. *Tebasan* means that the traders have the responsibility to cut or harvest the paddy in the field. Operationally *penebas* seek paddy which is ready to be harvested in the field and then negotiate

with the farmer. In other cases farmers approach the house of *penebas* to offer their paddy. The negotiation between the *penebas* and the farmer includes the price and time of harvesting. Unit of the transaction is *bagian* (1 *bagian* = 2,250 m^2). The agreed transaction is called *pedotan*, which literally means broken off. *Pedotan* implies that the negotiation has finished once the *penebas* and the farmers have come to a mutual agreement.

In harvesting activities, *penebas* use *derepan* institution in which harvesting workers or *penderep* freely join and are then paid in kind by way of a certain share of the paddy harvested, called *bawon*. This institution is the same as that practiced by farmers, but the share of *bawon* differs. Usually farmers use *moro wolu* (1/8) up to *moro sepuluh* (1/10) depending upon the relation between the employers and the harvesting workers. Meanwhile, *penebas* use *moro rolas* (1/12) up to *moro telulas* (1/13). The share is determined by the person in charge who transports the paddy harvested from the field to the house of the *penebas*. If the *penebas* bear transportation costs, *moro telulas* would apply. Oppositely if transportation costs are borne by *penderep*, *moro rolas* would be employed. *Moro telulas* (1/13) means that the *penderep* receive 1/13 of the paddy harvested and the *penebas* get 12/13 respectively. The *Penderep* usually live in the same hamlet as the *penebas* or nearby.

Table III-6-3 The percentage of farmers practicing *tebasan* institution and the share of *bawon* in the study area in 2002

No.	Hamlet	Percentage of farmers (%)[a]		*Share of* bawon[b]	
		Tebasan	*Others*	*Penebas*	Farmers
1	Susukan I	45	55	1/12 to 1/13	1/10
2	Susukan II	50	50	1/12 to 1/13	1/10
3	Susukan III	60	40	1/12 to 1/13	1/10
4	Somokaton	25	75	1/12 to 1/13	1/10
5	Ngaran	80	20	1/12 to 1/13	1/10
6	Planggok	25	75	1/12 to 1/13	1/10
7	Grajegan	75	25	1/12 to 1/13	1/8
8	Bolu	75	25	1/12 to 1/13	1/8
9	Nyamplung	20	80	1/12 to 1/13	1/8
10	Seyegan	50	50	1/12 to 1/13	1/8
11	Sonoharjo	60	40	1/12 to 1/13	1/8
12	Bantulan	60	40	1/12 to 1/13	1/8
Average		52	48	1/12 to 1/13	1/8 to 1/10

Notes: [a]The data was estimated by asking the heads of the hamlet how many percent of the farmers in the study area sold their paddy under *tebasan* institution and how many percent used other means; [b]The data show the share of *bawon* in *derepan* institution practiced by the *penebas* and the farmers.
Source: Data of interviewed with 12 heads of hamlets in Margokaton in Marketing and Distribution Survey (2002).

3-1-2 Penguyang

Penguyang purchase wet paddy from the *penebas* or the farmers and sell milled rice to a retailer or large collector. Therefore, *penguyang* handle drying and milling activities. Traditionally, *nguyang* means transforming paddy into milled rice ready for sale. Processing paddy into milled rice for ones own consumption is called *nggentang*. Some *penebas* offered a drying floor as a service for *penguyang*. Most of the *penguyang* are female (see in Table III-6-4).

3-1-3 Rice miller

There are two types of rice millers in the study area. First, rice millers who only offer milling service and; second, rice millers who offer trading business in addition to the milling service. Rice millers usually offer a drying floor and warehouse as a service for the *penguyang*. Some rice millers also provide and rent a mini truck to the *penguyang* or *penebas*. In some cases, particularly rice millers type 1, also extend credit to the *penguyang*. They extend credit to procure paddy for the operation of their milling machine. In general, it could be said that the location of the rice miller is also the business address of the *penguyang* because they mill rice there too.

3-1-4 Large collector

Large collectors purchase milled rice from *penguyang*, rice millers or *penebas* and sell it to retailers. Transactions take place between the large collectors and the *penguyang* at the place of the rice millers, with the milled rice transported to their house and then distributed to retailers in the markets of local towns and the city of Yogyakarta.

3-1-5 Retailer

Retailers purchase milled rice from the *penguyang*, *penebas* or wholesalers and sell it directly to consumers at markets or small shops. In the case of transaction with *penguyang* or *penebas*, a retailer would come to the milling site where *penguyang* or *penebas* mill their rice. Therefore, transportation costs

Table III-6-4 Number of traders by gender and type of traders (people)

Gender	1T	2BB	3HL	4JR	5PC	Total
Female	15	26	5	4	21	71
Male	6	1	7	4	5	23
Total	21	27	12	8	26	94

Note: Classification of traders is same with Figure III-6-2.
Source: Marketing and Distribution Survey (2001 and 2002).

between the milling site and the market are borne by the retailers. Transaction between retailers and large collectors is usually done at the market. Wholesalers bear the transportation cost by delivering rice to retailers. The markets where retailers do business are Beringharjo, Kranggan, Pingit, Karangwaru, Lempuyangan, Sentul, and Kolombo.

As mentioned above, the study interviewed 94 traders which consist of 21 harvesting contractors, 27 collectors, 12 rice millers, 8 wholesalers and 26 retailers. The majority of the traders are female, accounting for 75.5% (71 out of 94) and they act mostly as harvesting contractors, collectors and retailers.

3-2 Business mode and trading experience

Status and mode of trading indicate the role of trading for each trader, particularly in terms of its contribution to their income and time allocation. Table III-6-5 shows status and trading experience of traders. Most of the traders (91%) considered trading as their primary source of employment, 68% as their full time employment and 23% as part time employment. Meanwhile the rest (9%) considered trading as a secondary source of employment. Intuitively, time allocation for the primary source of employment was 91% and for the secondary source of employment 9%. All types of traders had a side job except large collectors. Regarding the business mode, most traders trade rice annually.

Table III-6-5 Trading experience by status of trading (years)

Status	1T	2BB	3HL	4JR	5PC	Total
Full-time primary source of employment	22	19	16	14	15	
	(8)	(22)	(5)	(8)	(20)	(63)
Full-time primary source of employment	18	16	28	–	9	
	(9)	(5)	(1)	–	(6)	(21)
Secondary source of employment	19	–	17	–		
	(3)	–	(6)	–	–	(9)
Average	20	19	17	14	13	
Total	(20)	(27)	(12)	(8)	(26)	(93)

Note: The figures inside of ( ) are sample numbers
Source: Marketing and Distribution Survey (2001 and 2002).

Table III-6-6 Intuitive time allocation for primary and secondary source of employment (%)

Data	1T	2BB	3HL	4JR	5PC	Total
Primary source of employment	82	91	98	100	93	91
Secondary source of employment	18	9	2	0	7	9

Note: The data was estimated by asking the traders about their primary and secondary source of employment and the percentage of time allocation.
Source: Marketing and Distribution Survey (2001 and 2002).

The trading experience of the harvesting contractors and collectors was the longest, each accounted for 20 years and 19 years respectively. The trading experience of retailers was the shortest (13 years). Some traders also gained training experience from their parents.

Though the majority of traders considered trading as their primary source of employment, they did not have a business license or a business form. There were only 16% of traders who owned a business license and a business form, namely the rice millers. They mainly held a business license for milling, issued by the local government of Sleman. Meanwhile, the majority of their business forms were for trading, which in local terminology is called *Usaha Dagang* (UD).

3-3 Endowments of facilities and transportation

Endowments of facilities and means of transportation refers to the investment and availability of equipment of each trader to handle marketing activities. Table III-6-7 reports the number of facilities and transportation means owned by each trader. Collectors had poor facilities. Their transportation equipment was mainly by bicycle. However, they usually utilize the facilities of the harvesting contractors or millers. All types of traders except the collectors own a warehouse, drying floor and a mini truck.

Table III-6-7 Endowments of facilities and mean of transportation (unit)

Facilities	1T (n = 21)	2BB (n = 27)	3HL (n = 12)	4JR (n = 8)	5PC (n = 26)	Total (94)
Warehouse	3	–	11	6	6	26
Drying floor	3	–	12	3	1	19
Truck	–	–	1	–	–	1
Mini truck	5	–	5	6	7	23
Motorbike	9	6	–	2	9	26
Bicycle	11	22	–	1	5	39

Source: Marketing and Distribution Survey (2001 and 2002).

Table III-6-8 Turnover by form of rice (tons, Rp/kg, 000 Rp)

Commodity	Turnover	1T	2BB	3HL	4JR	5PC	Total
Paddy	Quantity (tons)	134					134
	Price (Rp/kg)	1,161					1,161
	Value (000 Rp)	142,824					142,824
Milled rice	Quantity (tons)	78	44	229	157	50	112
	Price (Rp/kg)	2,183	2,248	2,340	2,425	2,526	2,344
	Value (000 Rp)	173,000	88,448	279,533	396,167	127,057	212,841

Source: Marketing and Distribution Survey (2001 and 2002).

3-4 Scale of trading

The average turnover of paddy was 134 tons per year and 112 tons of milled rice per year. The turnover of the rice millers was higher than that of the others. It was accounted to be 229 ton/year of milled rice. Harvesting contractors handled both paddy and milled rice. The turnover of collectors was the lowest.

4. Mode of Transaction and Operation

This section reviews some business practices among traders, such as: trade relations among traders, mode of payment, timing of payment and duration for completing payment. The study investigated the relationship between traders and their regular customers to indicate trade relations among traders. Table III-6-9 shows from whom each trader mainly procures rice.

4-1 Regular customer

Harvesting contractors (1T) procure paddy directly from farmers. Collectors (2BB) procure paddy from farmers or harvesting contractors. Rice millers (3HL) procure paddy from harvesting contractors or collectors. Meanwhile large collectors (4JR) usually procure milled rice from millers or collectors. Retailers (5PC) procure milled rice from collectors, millers or large collectors. Respectively,

Table III-6-9 Average of regular customers in procuring rice (people)

Types of commodity	Regular customer[a]	Types of buyer 1T (n = 9)	2BB (n = 16)	3HL (n = 4)	4JR (n = 4)	5PC (n = 15)
Paddy	Farmer	36	11			
	Harvesting contractor		2	2		
	Harvesting contractor or collector			20		
	Farmer or harvesting contractor		5			
	Average	32	4	6		
Milled rice	Collector				1	2
	Middle collector				2	2
	Middle collector or miller				2	
	Miller				4	2
	Large collector					1
	Average				2	2
Average		32	4	6	2	2

Note: [a]Classification of regular customer is based on the answer of respondents, different from the traders classification (1T-5PC).

Source: Marketing and Distribution Survey (2001 and 2002).

Table III-6-10 Average member of regular customers in selling (people)

Commodity	Regular customer[a]	Type of sellers				
		1T (n = 9)	2BB (n = 16)	3HL (n = 4)	4JR (n = 4)	5PC (n = 15)
Paddy	Collector	4				
	Miller	4				
	Average	4				
Milled rice	Collector		2	3	4	
	Middle collector		1			
	Large collector	4	2	3	2	
	Large collector or retailer		3	4		
	Retailer	3	4	2	10	2
	Consumer					9
	Average	3	2	3	7	6
Average		4	2	3	7	6

Note: [a]Classification of regular customer is based on the answer of respondents, different from the traders classification (1T-5PC).
Source: Marketing and Distribution Survey (2001 and 2002).

a harvesting contractor, a collector, a miller, a large collector and a retailer have 32, 4, 6, 2 and 2 regular customers in procuring their commodity.

Table III-6-10 shows to whom each trader mainly sells their commodity. Harvesting contractors (1T) sell paddy to collectors or millers. Collectors (2BB) sell milled rice mainly to retailers or large collectors. Rice millers (3HL) sell milled rice mainly to large collectors or retailers. Large collectors (4JR) sell milled rice mainly to retailers. Finally, retailers sell their commodity to consumers. On average, a harvesting contractor, a collector, a miller, a large collector and a retailer have 4, 2, 3, 7 and 6 regular customers in selling their crop.

The average number of regular customers of a harvesting contractor, a collector and a miller in procuring rice (backward channel) is larger than the number when they sell (forward channel). It means that those traders procure their crop from many traders and then sell to a fewer number. Conversely, the average number of regular customers of a large collector and a retailer in procuring their crops is smaller than when they are selling.

4-2 Mode and timing of payment

Mode of payment indicates the extent of commercialization. As the degree of commercialization increases, bank remittances or cheques will be used for payment in addition to cash money. However, this study did not find any cases where traders used bank remittances or cheques as a form of payment. Traders only used cash money to procure their crops. Similarly, the traders also received

payment in cash.

Timing of payment indicates mutual relations among traders. Partially deferred payment (d) and totally deferred payment (dz) were the common timing of payment practiced by all types of traders both in procurement and selling transactions (see in Table III-6-11 and Table III-6-12). Harvesting contractors and collectors practiced small prepayment (a) which in local terminology is called *panjar*. Direct payment was only practiced by collectors and retailers.

Average duration of completing payment was 4 days. It means that the traders completed payment in 4 days after the first payment. Harvesting contractors completed the payment in 5 days, collectors in 4 days, rice millers in 3 days, wholesalers in 4 days and retailers in 4 days. Duration of completing payment also varied according to the timing of payment. The longest duration was *Panjar* and partly deferred payment, each amounted to 5 days. The shortest duration was significant prepayment.

The average duration of receiving a complete payment was 6 days. It means that the traders received a complete payment in 6 days after the first payment. Harvesting contractors received a complete payment in 12 days after the first payment, collectors in 4 days, rice millers in 3 days, wholesalers in 6 days, and retailers in 4 days. Average duration of receiving a complete payment (6 days) was

Table III-6-11 Average duration of completing payment in procurement (days)

Timing of payment	1T (n = 11)	2BB (n = 8)	3HL (n = 2)	4JR (n = 2)	5PC (n = 13)	Average (n = 36)
Small prepayment, a	5	3				5
Significant prepayment, aa	2					2
Direct payment/cash and carry, c		0			0	0
Partially deferred payment, d	7	5	2	5	4	5
Totally deferred payment, dz	5	6	4		4	4
Combination d and dz				2		2

Source: Marketing and Distribution Survey (2001 and 2002).

Table III-6-12 Average duration of receiving a complete payment (days)

Timing of payment	1T (n = 8)	2BB (n = 7)	3HL (n = 4)	4JR (n = 4)	5PC (n = 6)	Average (n = 29)
Small prepayment, a		5				5
Significant prepayment, aa	22					22
Direct payment/cash and carry, c					0	0
Partially deferred payment, d	5	4	5	10	5	5
Totally deferred payment, dz	5	3	3	5	6	4
Combination c and dz				3		3
Combination d and dz			2			2

Source: Marketing and Distribution Survey (2001 and 2002).

longer than that of completing payment (4 days). It indicates that a trader in the study area competes with others by completing payment sooner and receiving a complete payment in a longer period of time.

4-3 Working capital and credit ties

Mode and timing of payment and trading scale relate to the availability of working capital. This sub-section discusses the working capital of each trader. As seen in Table III-6-13, the working capital of rice millers was the largest while collectors had the smallest. This means that rice millers can operate on a larger trading scale. Meanwhile collectors operate on a smaller scale. Most of the working capital was self-owned by each trader.

Since Marketing and Distribution Survey 2002, data of outstanding credit for working capital is recorded. Table III-6-14 shows the number of transactions, amount of credit and from whom the traders borrowed money. Eighteen out of 49

Table III-6-13 Amount of working capital by types of trader (Rp)

Working capital	1T	2BB	3HL	4JR	5PC
Self fund	6,878,125	1,347,059	16,366,667	10,020,000	5,668,750
	(16)	(17)	(6)	(5)	(16)
Credit	875,000	147,059	6,666,667	1,800,000	3,003,125
	(16)	(17)	(6)	(5)	(16)
Average	8,613,889	1,480,952	17,962,500	10,350,000	6,386,957
	(18)	(21)	(8)	(6)	(23)

Note: The figures inside of ( ) are sample numbers.
Source: Marketing and Distribution Survey (2001 and 2002).

Table III-6-14 Amount of outstanding credit for working capital (Rp)

Lender	1T	2BB	3HL	4JR	5PC	Total
Bank, credit program	5,000,000	1,025,000	14,666,667	4,566,667		5,842,857
	(4)	(4)	(3)	(3)		(14)
Farmer group		500,000				500,000
		(1)				(1)
Rice miller		1,000,000			700,000	850,000
		(1)			(1)	(2)
Collector	4,000,000					4,000,000
	(1)					(1)
Average	4,800,000	933,333	14,666,667	4,566,667	700,000	4,888,889
	(5)	(6)	(3)	(3)	(1)	(18)

Notes: The figures inside of ( ) are sample numbers.
Source: Marketing and Distribution Survey (2002), 49 traders.

Table III-6-15 Amount of money lent by types of trader (Rp)

Borrower	1T	2BB	3HL	4JR	5PC	Total
Rice collector		175,429	1,700,000			514,222
		(8)	(3)			(11)
Regular customer				6,000,000		6,000,000
				(1)		(1)
NA	1,450,000	300,000			4,560,000	2,103,333
	(1)	(2)			(1)	(4)
Average	1,450,000	191,000	1,700,000	6,000,000	4,560,000	1,302,923
	(1)	(10)	(3)	(1)	(1)	(16)

Note: NA = not available.
Source: Marketing and Distribution Survey (2002).

(36.74%) traders in this study were borrowing money for operating their business. Most of traders borrowed money from the bank (credit program). Some of them also borrowed money by interlinking transactions with rice millers or collectors. Those interlinking transactions were mainly aimed to establish mutual relations among traders and for maintaining the rice marketing channel. In the case of millers, it aimed to guarantee paddy procurement for utilizing their milling machines. The average outstanding credit was Rp 4,888,889. Outstanding credit of rice millers was the largest and the retailers had the smallest.

The interlinking transaction is also indicated by money-lending transactions. Sixteen out of 49 (32.65%) traders in this study advanced credit to other parties, mainly to rice collectors. Collectors were market players who were often times involved in lending and borrowing money. The large collectors lent the largest average amount of money.

5. Margin and Marketing Cost

This section discusses margin and marketing cost to indicate the condition of free entry and free exit of the rice market. Traders will still remain in the market if they can get enough margin. Oppositely, if traders cannot get enough margin, they will leave the market in the long run. The margin must cover all marketing costs and substantial profit linked to the incentive of traders. Margin is the difference between the buying and selling price. Suppose that P_b and P_s are buying price and selling price respectively, thus margin (M) can be formulated as: $M = P_s - P_b$.

There are two forms of traded rice, un-milled rice or paddy (Pd) and milled rice (Rc). Accordingly, the analysis is classified into three types of transaction: (1) paddy-paddy: the traders procure and sell rice in the form of paddy, (2) paddy-rice: the traders procure rice in the form of paddy and sell it in the form of milled rice, and (3) rice-rice: the traders procure and sell rice in the form of milled rice.

Figure III-6-3 shows the structure of rice price in the study area. Selling price consists of buying price and margin. The height of each bar shows the value of buying price plus margin. As seen in the figure, traders in the producing area who handled Pd-Rc had a higher value of margin compared to Pd-Pd and Rc-Rc. The margin of the harvesting contractors (1T) who handled Pd-Rc was absolutely bigger than others. It is necessary to investigate whether or not the harvesting contractor earn monopolistic profit implied by their large margins. It is necessary to investigate the marketing cost.

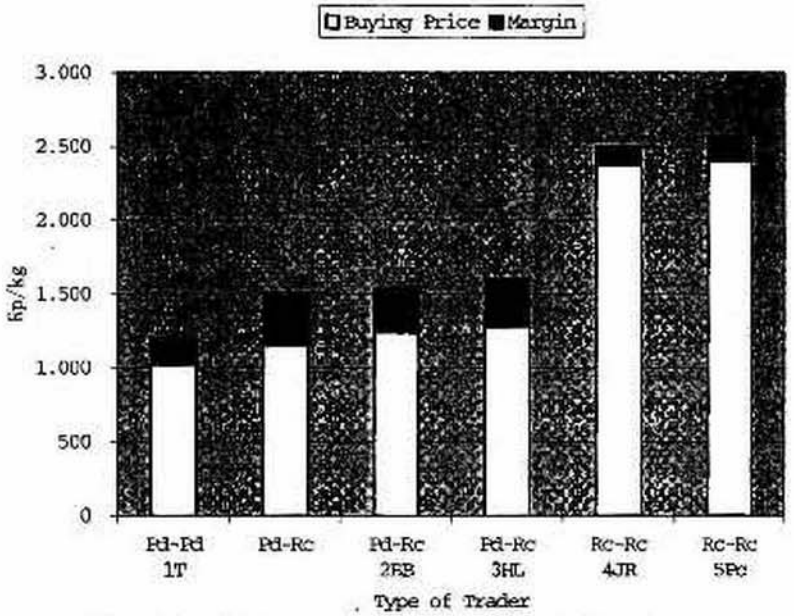


Figure III-6-3 Price structure of rice marketing in Yogyakarta

Table III-6-16 shows average margin rate of each trader by the type of transaction and the classification of buyer[4]. The margin rate varied by the type of traders and buyers. Margin rate from collector (2BB) to large collector was relatively greater than others. Meanwhile margin rate of large collector (4JR) was relatively small. The margin rate relates to the cost of marketing and profit. It is no small matter to say that Pd-Rc transaction comprises many kinds of marketing costs such as drying, milling and transportation cost included, and thus it has a greater margin rate compared to other types of transactions.

Marketing costs are all expenses involved to operate marketing activities such as harvesting, drying, milling, storing and transportation. Marketing cost consists of fixed cost and variable cost. However, this paper only investigates the variable cost. It was estimated by asking the respondents regarding their marketing activities and the cost involved. If respondents could not state the cost per unit of

quantity (kilogram, quintal, and ton), the unit cost was simply estimated by converting the original data of cost into cost per year and then dividing that by the scale of trading per year. The variable costs of rice marketing can be seen in Table III-6-17.

Table III-6-16 Average of margin rate by types of transaction and classification of regular buyer

Type of traders	Type of transactions	Classification of buyer					
		Collector	Middle collector	Miller	Large collector	Retailer	Consumer
1T	Pd-Pd	0.16		0.17			
	Pd-Rc				0.48	0.47	
	Average	0.16		0.17	0.48	0.47	
2BB	Pd-Rc	0.45	0.44		0.51	0.45	
3HL	Pd-Rc	0.43			0.45	0.43	
4JR	Rc-Rc				0.02	0.05	
5PC	Rc-Rc					0.05	0.08

Note: Margin rate = (selling price – buying price)/selling price.
Source: Marketing and Distribution Survey (2001 and 2002).

Table III-6-17 Variable cost of rice marketing by type of transaction (Rp/kg)

Type of transaction	1T	2BB	3HL	4JR	5PC
Pd-Pd	125				
Pd-Rc	304	103	56		
Rc-Rc				69	98

Source: Marketing and Distribution Survey (2001 and 2002).

The variable cost of harvesting contractors (1T) consisted of *bawon* or wages of harvesting workers, transportation cost and other operation costs. As mentioned before, harvesting contractors in the study area used *moro rolas* or *moro telulas* in *bawon*. The milling fee also became a part of their costs when they processed the paddy into milled rice. Therefore the variable cost of the harvesting contractors who handled Pd-Rc was the largest.

The variable cost of collectors (2BB) consisted of drying cost, transportation cost, milling fee and other operation costs. However the milling fee was the main variable cost for the collectors because they handled drying and transportation by using family labor. This paper did not take into account wage of family labor as marketing costs, therefore profit in this paper refers to income. Collectors are very important players in rice marketing. They work hard and transport rice by bicycle from the harvesting contractor's house to the miller's.

The variable cost of millers (3HL) comprised transportation cost, milling cost and other operation costs. The cost for fuel, fabric oil and wages of employed

workers were the main variable costs for them for operating their transportation means and milling machines. Meanwhile the variable cost of large collectors (4JR) and retailers (5PC) was mainly transportation cost and input costs for packing and storing.

Investigation into the marketing costs revealed that most of the margin was shared by the variable costs except in the case of the millers and the collectors (see Figure III-6-4). The trading scale of collectors is small, they maintain their income by using family labor to handle marketing activities such as drying and transportation. Therefore they can earn sufficient income from rice trading. The main transportation equipment for them is bicycle. Milling services in the study area seem to be able to get enough profit because rice is cultivated all year round, but it is not yet certain. Millers invite collectors who will utilize their milling machines. The millers compete against each other by providing working capital to collectors[5].

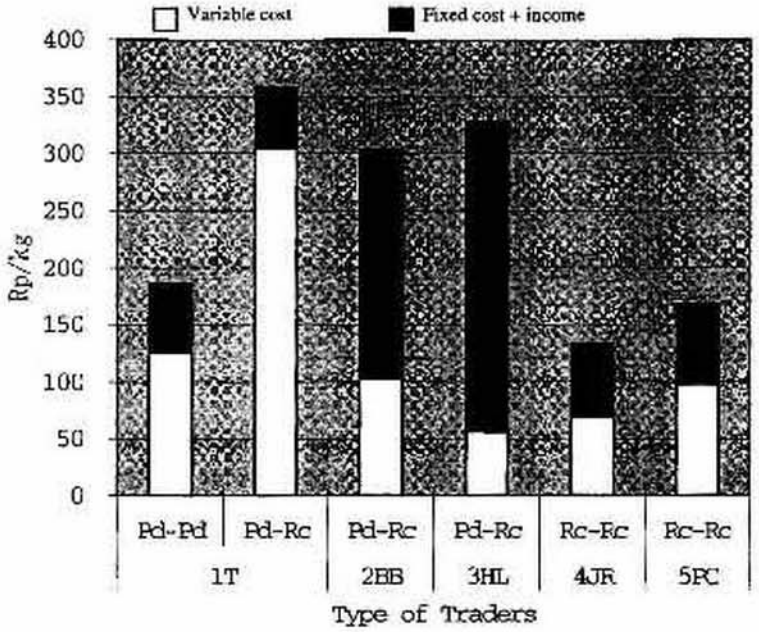


Figure III-6-4 Structure of marketing margin

6. Competitiveness of Local Market in Producing Area

The structure of margin discussed above shows the variable cost and the possibility of profit level of each trader. The following section will discuss the structure of the rice market to indicate the efficiency and imperfection of the

market. In the absence of fixed cost data, structure of market can be estimated by calculating Monopoly Index (MPI).

Suppose that P_b = buying price, Q_b = buying quantity, P_s = selling price, and Q_s = selling quantity; revenue of a trader (R) can be formulated as follows:

$$R = P_sQ_s - P_bQ_b. \quad (1)$$

If:

$$Q_b = Q_s = Q,\ P_s - P_b = M,\ M = D(Q),$$

thus:

$$R = P_sQ - P_bQ = (P_s - P_b)Q = MQ \quad (2)$$

M is marketing margin.

If C_f = fixed cost and C_v = variable cost, total marketing cost of a trader (C) can be formulated as:

$$C = C_f + C_vQ. \quad (3)$$

Meanwhile profit of a trader (π) can be formulated as:

$$\pi = R - C = MQ - C_f - C_vQ \quad (4)$$

In the monopolistic competition market, traders maximize profit by equating marginal revenue (MR) with marginal cost (MC).

$$MR = MC \quad (5)$$

$$MR = \frac{d(MQ)}{dQ} = M + Q\frac{dM}{dQ} = M(1 + \frac{dM/M}{dQ/Q}) \quad (6)$$

thus:

$$M(1 + \frac{dM/M}{dQ/Q}) = MC. \quad (7)$$

If:

$$\varepsilon = -(\frac{dQ/Q}{dM/M})$$

is price elasticity, thus:

$$M(1 - \frac{1}{\varepsilon}) = MC$$

$$\frac{1}{\varepsilon} = 1 - \frac{MC}{M} \quad (8)$$

$\frac{1}{\varepsilon}$ = Lerner's Index or degree of monopoly, $0 \leq \frac{1}{\varepsilon} \leq 1$.

$$\frac{1}{\varepsilon}\begin{cases} \text{If } MC = M, \ \frac{1}{\varepsilon} = 0, \text{ perfect competition,} \\ \text{If } M > MC, \ 0 < \frac{1}{\varepsilon} < 1, \\ \text{If } M \to \infty, \ \frac{1}{\varepsilon} = 1, \text{ monopoly.} \end{cases}$$

Estimation of market structure can be simplified by calculating the monopoly index (MPI):

$$MPI = \frac{M}{MC}. \tag{9}$$

$$MC = \frac{dC}{dQ} = C_v,$$

$$MPI = \frac{M}{C_v} \tag{10}$$

The monopoly index is the proportion of marketing margin to variable cost. Higher value of MPI indicates the higher degree of monopoly.

Table III-6-18 shows the MPI of each trader in rice marketing in the study area. As seen in the table, the MPI varied by types of trader and transaction. Harvesting contractors were relatively the most efficient players in the study area by MPI 1.42. Large collectors were more efficient than collectors, and collectors were more efficient than retailers by MPI 2.60, 2.92 and 2.95 respectively. Rice millers were the most non-efficient market players by MPI 4.92. The MPI also varied by types of transaction. Consistent with the MPI by types of traders, the MPI of Pd-Pd was also smaller than others, accounting for 1.48. Meanwhile MPI of Pd-Rc was the greatest (3.03).

Lack of information and access to government policy and regulations may have existed in the study area as indicated by the fact that almost all of the millers

Table III-6-18 Degree of monopoly by type of transaction

Type of transaction	1T (n = 17)	2BB (n = 17)	3HL (n = 4)	4JR (n = 4)	5PC (n = 15)	Average
Pd-Pd (n=14)	1.48					1.48
Pd-Rc (n=24)	1.17	2.92	4.92			3.03
Rc-Rc (n=19)				2.60	2.95	2.88
Average	1.42	2.92	4.92	2.60	2.95	2.60

Source: Marketing and Distribution Survey (2001 and 2002).

are government officers. The local government of Sleman regulates milling business by local regulation (*Peraturan Daerah/Perda*) No. 8/1986 and in terms of the retribution cost since May 23, 1998, the milling business has been regulated by *Perda* No. 6/1998. Under these regulations there are many required documents that must be processed to enter the milling business, such as: permission of business place, permission of indigenous societies, recommendation from agricultural office, business license, construction permission and so on. A minimum distance among rice millers is also recommended, that is, more than a radius of 1 km.

However, compared to the previous research, rice marketing in the study area was relatively more efficient. According to market survey conducted in East Java in 1991, Yonekura (1995) reported that the degree of monopoly of harvesting contractor was 4.04 for paddy, *bakul* (small collector) 4.68 for paddy and 2.38 for milled rice, middle collector 3.23 for paddy, large local collector in producing area 5.50 for paddy and 7.99 for milled rice, and large local collector in collection and distribution center was 5.60 for paddy and 3.44 for milled rice. This is one indication that many of the government's policies during the last decade altogether have developed the rice marketing system in Indonesia. This study cannot identify with certainty which policy change made a greater contribution to the rice market development in Indonesia. However, during the last decade, there were at least five important policy changes to deregulate agriculture following the January 1998 Letter of Intent (LOI) to the International Monetary Fund (IMF). Those were the liberalization of the rice market, de-monopolizing of BULOG, cessation of loans from the Bank of Indonesia (BI) for rice procurement by Law No. 23/1998, reforming local tax law by enacting Law No. 18/1997 and implementing decentralization policy by Law No. 22/1999.

As mentioned previously in the introduction, the liberalization of the rice market and the de-monopolizing of BULOG have been accompanied by permitting private companies to import rice. Therefore, local traders face a new situation whereby they must compete with international parties. The local traders must operate more efficiently to cope with the increasingly competitive circumstances. Cessation of loans from the BI limited the BULOG operations because BULOG subsequently must use commercial credit to finance its operations. Therefore competition among local traders has increased to take advantage of the limited operational capacity of BULOG. The effects of the two latter policy changes depends entirely upon their implementation in each region. Though rice marketing has been improved during the last decade, this study cannot reveal the direct causality impact between government policies and the competitiveness of local markets.

7. Conclusion

Rice trading is very important in the study area because the rice surplus available for sale is quite large. The rice availability in Seyegan Sub-District in

2000 accounted for 212 kg/capita/year, above the national average of consumption per capita (133 kg/capita/year).

The Marketing and Distribution Survey 2001 and 2002 identified five types of traders involved in rice marketing, namely *penebas* (harvesting contractors), *penguyang* (collectors), rice millers, large collectors and retailers. The role of *penebas* is mainly to harvest rice, *penguyang* and millers handle drying and milling, large collectors deliver rice from the study area to retailers in Yogyakartan markets and finally the retailers sell rice to consumers.

Under the process of liberalization and the policy changes of the government, the traders have been maintaining their marketing channel by adjusting the mode of payment and extending credit to their regular customers. Partially deferred payment (d) and totally deferred payment (dz) became the common timing of payment to maintain the relationships among traders. Moreover, credit ties among traders are also important for the rice procurement of each trader.

Rice marketing in the study area was also relatively more efficient compared to the previous research in East Java as indicated by the smaller value of MPI. Harvesting contractors were the most competitive players by MPI 1.42, and then large collectors, collectors and retailers by MPI 2.60, 2.92 and 2.95 respectively. Rice millers were the most non-competitive market when compared to others by MPI 4.92. However, the MPI value of rice millers has substantially improved compared to the previous study. This implies that liberalization of the rice market, de-monopolizing of BULOG, cessation of loans from BI for rice procurement, implementation of the decentralization policy and the fiscal balance between the central government and the local government altogether have improved the competitiveness of the local rice market over the last ten years.

Notes

1. Seyegan Sub-district is bordered by Sleman Sub-district in the north east, Tempel Sub-district in the north west, Minggir Sub-district in the west, Godean Sub-district in the south and Mlati Sub-district in the east.
2. The name of hamlets in Margokaton Village are Susukan I, Susukan II, Susukan III, Somokaton, Ngaran, Planggok, Grajegan, Bolu, Nyamplung, Seyegan, Sonoharjo and Bantulan.
3. Mataram Canal was constructed by Mataram Kingdom, connecting Progo River in the west and Opak River in the east.
4. *Pon, Kliwon, Wage, Legi and Pahing.*
5. Margin rate is the proportion of margin to selling price. The classification of buyer is different from the type of traders (1T-5PC). The classification is depended on the answer of respondents in our field survey.
6. Competition between outsider and indigenous people also occurred in the study area. Rice millers in Ngino XII formerly was established by outsider, but he stopped his operation because indigenous people did not permit it and wanted to take over the miller.

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