

CHARACTERISTICS AND FUNCTIONS OF LABOR INSTITUTIONS IN RURAL JAVA: A CASE STUDY IN YOGYAKARTA PROVINCE

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ABSTRACT

Although social-economic differentiation has remarkably changed village societies in rural Java, villagers still maintain strong relationships. These relationships fall under the mutual assistance described as *gotong royong*. The institutions of *gotong royong* cover a wide area of activities. The market economy is likely to weaken the stabilizing function of rural community, but this weakening process will not be so simple. Thus, although the impact of the penetration of the market economy in rural society is inevitable, mutual assistance activities can still serve a positive function. Much of the previous research on *gotong royong* has focused on general descriptions of institutional functions and coverage area. In contrast, few studies have conducted detailed analysis of institutional characteristics, function and share in farming operation, and the framework structure of institutions within the context of exchange theory, which emphasizes such factors as timing, equality, and type of reciprocity. The present study provides novel insights into the changes and current situation of labor institution practices mainly for collective works and labor exchange in rural Java. The study specifically aimed to evaluate the characteristics, categorization, and function of the labor institution in farming operations and to identify factors that influence changes in and maintenance of labor institution practices.

Key words: mutual help, *gotong royong*, agrarian, community, Indonesia

INTRODUCTION

Much of the development literature has studied the positive psychosocial effects of rural communities. The function of community arises from the principle of reciprocity, and a breakdown in this community can explain at least to some extent failures of the market and the government¹. In rural communities of Indonesia, specifically in rural Java, social relationships and human cooperation² that are driven by reciprocal transactions and mutual assistances among rural people are still thriving. This system of reciprocal transactions is widely known as *gotong royong*, and it plays an important role on how rural people allocate labor. Most of the research conducted so far on practices of *gotong royong* in rural Java has focused on general descriptions of the activities involved and their coverage. However, in-depth empirical study dealing with specific characteristic and function of each institution, function in farming operation and categorization of institution based on principle of exchange theory such as timing, equality and type of reciprocity has not been carried out.

¹ The comparative advantage of community lies in the supply of local public goods (including provision of a social safety net) as compared with the market advantage in the supply of private goods and the state advantage in the supply of global and pure public goods (Hayami, 2006a).

² Over the past decade, interest among social scientists continues to grow in research on issues of human cooperation that deal with "social capital" (Grootaert and Bastelaer, 2002).

To address the research gap, the present study provides novel insights into customs of labor institutions in rural Java. In particular, the study aimed to (1) evaluate the characteristics and activities of labor institutions in farming operations, and (2) identify factors that influence changes and maintenance of labor institution practices.

REVIEW OF RELATED LITERATURE

Cooperation in a community is developed by a group of people connected by mutual trust through extensive personal interactions that are based on consent and equitable division of labor among community members in order to move in a socially desirable direction (Hayami, 2006b). Motivation to cooperate is rarely only based on simple payoff maximization; it is usually based on reputation building, trust, scorekeeping, and punishment (Palameta, 1998). Much of human behaviour does not appear to be motivated by a selfish preference for increases in physical goods and services (Robinson and Flora, 2003). Further, Kircher *et.al.* (1996) argue that human motivation cannot be reduced to the rational pursuit of self-interest. Many people tend to follow the norm of reciprocity in their social-economic cooperation.

According to the principle of reciprocity, human cooperation is sustainable because it is mutually beneficial and it overlaps social norms such as solidarity and generosity, cohesiveness, social approval, and a social safety net. In addition to the pattern of human cooperation, Fehr and Rockenbach (2004) argue that enforcing “social norm” and “strong reciprocity” are essential prerequisites to establish cooperation. Gouldner (1960) concisely stated that the norm of reciprocity involves certain actions and an obligation to repay the benefit received. As theorized by Benu (1977), the norm of reciprocity is very important in the context of social exchange³ and it dictates that people should help and not injure those who have helped them.

One type of exchange is referred to as generalized and balanced. Concerning generalized reciprocity, the requital may come very soon, and it may never come at all. Balanced reciprocity⁴ is characterized by precise balance: the reciprocation is the customary equivalent of the thing received and it occurs without delay, meaning that utility is provided within a finite period.

Communities in rural Java have maintained tight cooperation under a sense of mutual reciprocity that takes the form of mutual assistances of *gotong royong*, including maintenance of rural infrastructures, joint work to cope with natural disasters, mutual help for house construction and daily agricultural operations, and labor and financial support for important ceremonies (*slametan*⁵).

Gotong royong refers to a community-based and supportive ethics system derived from the Javanese village tradition of communal work and responsibility, in which the individual has certain moral obligations to the wider society (Rigg *et al.*, 1999). Mutual assistance helps to ensure that community members carry comparable loads and thereby share the burden of economic and social survival (Sumarjan and Breazele, 1993). The traditional spirit of mutually helpful activities arises out of mutual group interest, solidarity, reciprocity, and responsibility (Martaamidjaja and Rikhana, 1996). In fact, *gotong royong* satisfies not only public purposes but also private needs (Subejo and Iwamoto,

³ In the classical definition, an exchange refers to a *transaction* that is *reciprocated*. A transaction is the process whereby one transactor transfers an object to another transactor (Gregory, 2004).

⁴ Balanced reciprocity is similar to the concept of economic exchange involving cost-benefit calculations and “contractual basis arrangements,” such as in the case of typical labor exchange group.

⁵ The concept of *slametan* (literally “safe” or “happiness”) is a placid existence made possible by the absence of troubles and obstacles (Jay, 1969).

2003). Several scholars have confirmed the importance of *gotong royong* activity in rural Java (Kartodirdjo, 1978; Raharjo, 1979; Anonim, 1985; and Sairin, 2001).

Koentjaraningrat (1961) has analyzed in detail the different types of practices in rural Java described by *gotong royong*: (1) times of family bereavement and other calamities, (2) community work projects, (3) ritual feasts (*slametan*), (4) upkeep of ancestral graves, (5) construction and major repairs to houses, (6) agricultural production, and (7) collective labor.

Collective activity under *gotong royong* can be classified in one of three ways: (1) direct exchange, (2) generalized reciprocal assistance, and (3) labor mobilized on the basis of political status (Bowen, 1986). Theorizing in broader terms, Kawagoe *et al.* (1992) categorized *gotong royong* activities into three coverage levels: public work at the village level, public work at the hamlet or neighbourhood level, and mutual help for private purposes at the household level.

Even though socioeconomic conditions in rural Java are changing, village communities still maintain tight relationships (Ishikawa, 1981; Scott, 1976; and Rosen, 1975). Nevertheless, the changes in community activities and community social-economic conditions have likely affected the sustainability of cooperation behaviour in rural villages. Sullivan (1992) founded that people at the rural-urban interface in Java were still practicing collective activities, mainly for maintaining public facilities and helping one another to build houses. Some type of institutions for mutual help have disappeared or changed in response to economic interest of community and modernization process.

Most of the research conducted so far on *gotong royong* has focused on general descriptions of the activities involved and their coverage. However, in-depth empirical study dealing with specific characteristic and function of each institution, function in farming operation and categorization of institution based on principle of exchange theory such as timing, equality and type of reciprocity has not been carried out. To address this research gap, the present study provides insights into customs of labor institutions in rural Java.

METHODOLOGY

Field research was carried out in 2002 and 2003 covering four hamlets of the rural area in Yogyakarta Province. Data for this study were collected using techniques interviews, focus group discussions (FGDs), and analysis of documentation. Personal interview which was done in the study referred to Henn *et.al* (2006) as the face to face interview. The interview was done with selected households and community leaders such as hamlet heads and neighborhood chiefs. Gibbs (1997) stated that FGDs in principle is organized discussion with a selected group of individuals to gain information about their views and experiences of a topic. Benefit of the FGDs includes gaining insights into people's shared understanding of everyday life and the ways in which individuals are influenced by others in a group situation.

The following hamlets were studied: Plangkok and Somokaton in Margokaton Village of Sleman District, in northwest Yogyakarta; Watugajah in Girijati Village in the Gunung Kidul District, in southern Yogyakarta; and Jati in Giricahyo Village, also in the Gunung Kidul District. Selection of study sites considered the transformation process of labor institution practices in the research sites with different in resource endowments and job opportunities. The first two hamlets are located in lowland area which has the most favorable resources and high population mobility. The second hamlet is located in hilly area but close to coastal area where villagers to some extent have access on off farm jobs. The last hamlet is situated in the most remote area which has the most unfavorable resources endowment and very small access on off farm jobs. Regarding the sample households for interviewing, we have asked hamlet heads to choose appropriate farming families in proportion to the households' structure in landholding. In each hamlet, 30 households were selected and interviewed,

meaning that a total of 120 households were interviewed in the four surveyed hamlets. The interviewed households in each hamlet represented about 20-30 percent of total households in the hamlet.

Interviews were conducted using a questionnaire that had been pre-tested with a selected group of village members. Survey results were analyzed using descriptive and analytical methods. In term of the survey data, it has been picked out several related variables that pertained to theoretically relevant issues such as general condition of research sites, proportion of kinship relation, mutual helps and farming labor inputs. For the qualitative and descriptive analysis, we reviewed and categorized qualitative responds dealt with issues raised by the theory such as general characteristic of institutions, categorization of labor institutions and persistence level of the institutions. FGDs were held in each hamlet in order to obtain more detailed knowledge in addition to the surveys and to cross-check the results from direct interviews. The field research was conducted in four hamlets with different social, economic, and physical conditions. Table 1 shows the location and major characteristics of the research sites. The following discussion addresses three main factors for the research sites: (i) the physical conditions of farming, (ii) economic conditions, and (iii) social structure of the community.

Table 1. General conditions of the research sites.

Item	General Condition				
	Plangkok	Somokaton	Watugajah	Jati	
Research site (hamlet)	Plangkok	Somokaton	Watugajah	Jati	
Village	Margokaton	Margokaton	Girijati	Giricahyo	
District	Sleman	Sleman	Gunung Kidul	Gunung Kidul	
Area condition	Lowland	Lowland	Upland	Upland	
Soil type and topography	Clay, flat	Clay, flat	Clay/limestone, terraced	Limestone, terraced	
Distance from city (km)	10	10	32.4	40	
Road condition	Asphalted	Asphalted	Asphalted/traditional	Traditional	
Transport facilities	Small car/motorbike/bicycle	Small car/motorbike/bicycle	Small bus/truck	Truck/motor bike	
Irrigation system	Technical	Traditional	Traditional/rain-fed	Rain-fed	
Population	430	604	641	622	
Number of households	97	163	130	115	
Total land area (ha)	41.3	44.5	191.5	129.5	
Paddy field	31.0	23.0	22.1	-	
Dry field	-	-	144.2	127.0	
Compound	6.8	17.1	25.2	2.5	
Others	3.5	4.4	-	-	
Ave size of farmland (ha)	0.32	0.14	1.28	1.10	

Source: Village data in 2002

Water availability and soil conditions are important aspects of the physical conditions at the research sites. Water availability is greater in Plangkok and Somokaton, so farmers there enjoy relatively better conditions. Farmers in Plangkok can obtain enough water for irrigation even during the dry season, which allows for repeated cultivation of rice paddies. Farmers in Somokaton, on the other hand, take water from small springs that can supply enough water for paddy production in the rainy season and the first dry season only. The cropping pattern in Somokaton is paddy to paddy to secondary crops. In contrast, the irrigation conditions in Watugajah and Jati are much less favorable. Both hamlets are located on a hilly area built on a hard coral reef. While Watugajah can draw on some springs for paddy production in the rainy season, Jati has no source of water other than rainfall.

Farmers in Jati generally can grow only upland crops once a year, whereas farmers in Watugajah can grow paddy in the rainy season and secondary crops in the first dry season. Both Watugajah and Jati are located on a hilly area where terraced fields with stone walls have been constructed and maintained for many years through communal labor. People in Jati enjoy a reputation as excellent builders of terrace fields, to the extent that neighboring hamlets and villages ask them to construct their own terraced fields. This requires "group sales of labor" organized at the community level. In this way, physically difficult conditions in hilly coastal areas have necessitated and diversified group cooperation and have led to the organization of labor institutions.

The labor market is an important determinant of each village's economic conditions. Availability of off-farm job opportunities should affect farmers' perceptions of the opportunity costs of labor and should therefore reduce their motivation to join group activities. Of the hamlets studied, Planggok and Somokaton enjoy the most accessibility to urban areas. Distance from the city center is only 10 km and the transportation system is well organized. Villagers in both hamlets can easily commute to the city center, where a broad variety of non-farm jobs is available.

By contrast, Watugajah and Jati are located approximately 30-40 km from the city center, making it difficult for villagers to commute to the city center for daily work. In this sense, Jati has the worst access to a city. Several years ago, a small truck provided informal transportation from a market place near Jati to a coastal area hosting a local wholesale market, retail shops, and tourist industries. This new transportation link permitted the people of Jati to connect with "other worlds": selling products at the market, buying daily necessities for their own consumption or trading, and working in the tourist industries such as hotels and shops. Such transport linkages, however, remain uncommon in the hamlets studied. For example, villagers must rely on *ojek* service (chartered motorbike) to get from Jati to the market place, from which they can take the truck into the city. Thus, the hamlet of Jati has been separated from the outside world for many years, and this has contributed to the persistence of older types of labor institutions, as will be explained in greater detail later.

Social factors in the hamlets studied emphasize on kinship, which overlap considerably with neighbor relations. Mutual help among relatives has been practiced from generation to generation, especially in financing, labor exchange, and ceremonial (*slametan*) activities (Table 2). A tight social relationship among kin is far more extensive and far deeper in upland and remote hamlets, such as Jati in this study, where 80 percent of relatives live in the same village. This reflects low population mobility. We can assume that it is less difficult to provide mutual assistance when relatives live so close to one another.

Table 2. Kinship relations in the four surveyed hamlets.

Hamlet	Number of sample households	Number of relatives (both sides)				Places of residence			
		Total	Parents	Brothers	Sisters	Same house	Same hamlet	Same village	Other villages
Planggok	29	288	116	86	86	45	78	31	134
Somokaton	30	307	116	91	100	40	115	49	102
Watugajah	30	310	120	103	87	47	72	68	121
Jati	30	309	120	94	95	71	121	56	59
Composition (%)									
Planggok		100	40.3	29.9	29.9	15.6	27.1	10.8	46.5
Somokaton		100	37.8	29.6	32.6	13.0	37.5	16.0	33.2
Watugajah		100	38.7	33.2	28.1	15.2	23.2	21.9	39.0
Jati		100	38.8	30.4	30.7	23.0	39.2	18.1	19.1

Source: Household survey in 2002

The practice of inviting or being invited to ceremonies (*slametan*) is very common at our research sites. Even in Planggok with its higher population mobility, 81 percent of relatives usually invite one another to their *slametan* ceremonies. Providing mutual financial assistance is also quite common, varying from 70 percent in Planggok to 85 percent in Jati. Relatives also help one another in labor-intensive tasks, with the frequency of such assistance varying from 62 percent in Planggok to 84 percent in Somokaton and Jati. Further details are provided in Table 3.

Table 3. Mutual help among relatives in the four surveyed hamlets.

Hamlet	Mutual help (% of household)				Invitation to <i>slametan</i> (% of household)	
	In money		In labor		Yes	No
	Yes	No	Yes	No		
Planggok	70.8	26.7	62.8	34.7	81.3	13.2
Somokaton	78.2	20.8	84.0	15.0	93.5	5.5
Watugajah	80.0	18.7	72.9	25.8	89.4	8.7
Jati	85.1	12.3	84.1	13.3	88.7	4.9

Source: Household survey in 2002.

RESULTS AND DISCUSSION

Types and Characteristics of Labor Institutions

Villagers have organized institutions dedicated to specific activities and purposes. Some institutions can support similar activities and purposes. For instance, in farming operations, villagers can employ labor from several types of institution such as various exchange labor and hired labor. The present study focuses not only on the general functions of village labor institutions, but also on the specific types and characteristics in the different hamlets studied. The following discussion explains the major characteristics of each labor institution. This study identified eight categories of labor institutions practiced in the four hamlets: *gerakan*, *gugur gunung*, *rewang* and *layatan*, *sambatan*, *krubutan*, *gantian*, and *buruh tani* (Table 4). These were the only labor institutions practiced in the surveyed areas, based on villagers' reports.

(a) *Gerakan* is a joint activity in which community members construct or maintain public facilities. This activity is usually initiated by formal leaders in the community, such as hamlet heads and RW/RT⁶ chiefs. Such work projects can include constructing, repairing, or cleaning mosques, meeting rooms, roads, irrigation channels, springs, graveyards, and guardhouses. Organization of activity varies from RT to RW or even hamlet level. The working schedule and manner of contribution to the joint effort are flexible. The frequency of each activity depends on the conditions of each public facility.

(b) *Gugur gunung* is a joint activity to cope with emergency needs such as fires, landslides, and house destruction. The community therefore gives this activity the highest priority. *Gugur gunung* is commonly organized at the RT level, but in the case of big disasters, the hamlet as a whole coordinates joint work. Because of the critical importance of these activities, participation is extremely high, approaching nearly 100 percent. In the case of emergencies, the person who first discovers the affected area delivers the information to community members immediately for

deliberation and action. The work is usually continued until the rescue/rehabilitation work finishes. The core of participants comes from RT or RW or even the greater hamlet.

(c) *Rewang* and *Layatan*. Both *rewang* and *layatan* involve mutual help for important ceremonies in the village. *Rewang* is conducted at the ceremonial feast for marriages, circumcisions, or celebration of pregnancy. *Layatan*, on the other hand, is mutual help for funerals. Participants contribute by sharing labor or costs (money and food materials) for the ceremonies. It is also important for participants to share the joys or sadness of the host family. Participants commonly consist of neighbors and relatives.

Table 4. General characteristic of labor institutions in the four surveyed hamlets.

Type	Characteristics
<i>Gerakan</i>	Joint activities by community members to maintain public facilities such as mosques, meeting rooms, roads, irrigation channels, springs, graveyards, and guardhouses
<i>Gugur Gunung</i>	Joint activities by community members to cope with emergencies such as fires, landslides, and destruction of house
<i>Rewang/Layatan</i>	Mutual help for ceremonial activities such as funeral, marriage, and circumcision
<i>Sambatan</i>	Requested mutual help for house construction/repairing, terrace making, wood transportation, etc.
<i>Krubutan</i>	Exchange labor among small group members for farming activities and domestic work (yearly basis)
<i>Gantian</i>	Simplified type of <i>Krubutan</i> occurring on a seasonal basis
<i>Prayaan</i>	Joint sales of labor to obtain cash income or to create joint assets for the group
<i>Buruh upahan</i>	Hired labor compensated in cash or in kind

Source: Interviews in 2002

(d) *Sambatan*⁷ are requests to neighbors or relatives made by a client family wishing to build or repair his house or cattle/goat shed. In Planggok and Somokaton, *sambatan* can be issued at the time of brick baking, and in Jati and Watugajah for major agricultural operations, wood transport, or terrace construction. *Sambatan* is reciprocal aid in which the reciprocity appears to be flexible. The client family is not expected to give immediate returns to their assistants and neighbors, and strictly equal compensation of labor is not required. Asymmetrical help, therefore, may be available to the poor who cannot equally return the kindness of neighbors. Natural limits on kindness apply, however, and those who call for *sambatan* often will have strained relations within the community.

(e) *Krubutan* is joint work that rotates among members of a small group. Normally this involves approximately five people from different households who gather in one group and work together, with the positions on the work team rotating among the households involved. This is the strictest type of labor exchange among the types observed in the four hamlets, since it demands rigid reciprocity and equality in work sharing. Separate *krubutan* groups are organized for men and women, and the groups consist of neighbors, friends, and relatives. Group members gather every day, usually in the afternoon, and work together for agricultural operations, terrace making, wood fetching, and processing of agricultural products, among other activities.

⁷ *Sambatan* literally means "requests". *Sambatan* is an institution for providing assistance in response to a neighbor's request (Sullivan, 1992).

(f) *Gantian* is a simplified type of *krubutan*. It is generally organized only during the rainy season; thus, it can be referred to as a seasonal collective group. The number and composition of members is similar to that of *krubutan*. Members rotate working together for farming operations mainly involving land preparation and seed planting.

(g) *Prayaan* is group work like *krubutan* and *gantian*, but it differs in that it requires compensation through cash payments. At the same time, *prayaan* is different from hired labor due to its emphasis on the group. In fact, it can be seen as the group sale of labor, and the pricing differs sharply depending on whether the client is a member or non-member. The numbers of groups and of group members are flexible. The groups are organized separately by gender. Women's groups work mainly in agricultural operations, while men's activities are much broader, comprising agricultural operations, wood and stone collecting, terrace making, and plastering works. The group activity is usually done once a week in the afternoon. The participation of members is high (80-90 percent), and absent members are required to pay a penalty in cash. In using *prayaan*, prices are set for members and non-members. Members can employ a *prayaan* group at a cheaper price. Although the actual price levels differ for each *prayaan* group, all groups use the same principle to distinguish insiders from outsiders (Table 5).

Table 5. Wages of *Prayaan* activity.

Hamlet Group of	Watugajah		Jati	
	Men	Women	Men	Women
For members	500-2,000	300-2,500	2,500-5,000	1,000-4,000
For non-members				
Same RT	1,500-2,000	1,500-2,000	3,000-5,000	3,000-5,000
Same hamlet	5,000	3,500-5,000	4,000-7,000	3,000-7,000
Same village	7,000	7,000	7,000-10,000	7,000

Source: Interviews in 2002

Note: In all cases, all workers are given meals.

(h) *Buruh upahan*/hired labor is a type of contractual arrangement between employer (land owner) and employee. Employees offer labor and in return get wages which can be in cash or in kind. The contract is usually not written or formal, but is informal or a trust-based agreement. The most common form of wage paid in rural Java is in cash. Calculation of wage paid is mainly on the basis of a half day or a full day working. Hired labor can be utilised for various farming activities.

Labor Functions in Farming Operations

Compared to the hamlets studied, Planggok and Somokaton rely on fewer sources of labor in farming operations: villagers use only family and hired labor, and family labor is the predominant source. Hired labor is a larger fraction of labor activities in both of these hamlets compared to Watugajah and Jati, where family labor still predominates. However, sources of labor forces in Jati and Watugajah are more diverse, and they include family, *krubutan*, *gantian*, *sambatan*, *prayaan*, and hired labor. The role and contribution of mutual cooperation for farming is more significant in Watugajah and Jati.

Family labor accounts for 70-80 percent of total labor input in all hamlets. Since exchange labor has already disappeared in Planggok and Somokaton, the residual labor input is covered by hired labor, at the rates of 28.5 percent and 27.7 percent, respectively. On the contrary, traditional types of labor exchange remain important in Jati, where *krubutan*, the strictest type of exchange labor, still

accounts for 19.2 percent of labor input in agriculture (Tables 6). Watugajah is a transitional case, and cash payment to non-family members has become more important. Farming activities in the four hamlets that require relatively high labor input are (i) land preparation, (ii) seeding/transplanting, (iii) weeding, and (iv) harvesting. Irrigation work is also important in the paddy areas (Planggok, Somokaton, and Watugajah). The relatively high labor input for irrigation (15.9 percent) in Watugajah reflects the water scarcity there. It is only during the rainy season that farmers in Watugajah can grow paddy by taking irrigation from natural springs. In Jati, villagers heavily rely on rainwater, so that there is no irrigation work at all.

Table 6. Sources of labor input for each farming operation in Watugajah & Jati Hamlets

Type of Farming Operation	%							Total
	Family	Krubutan	Gantian	Sambatan	Prayaan	Hired	Total	
Watugajah								
Land preparation	62.8	1.4	15.8	2.0	0.0	18.0	100.0	13.2
Seeding/Transplanting	54.9	1.3	9.0	1.5	28.6	4.7	100.0	15.9
Fertilizer/Pesticide application	86.3	0.0	0.9	0.0	0.0	12.8	100.0	4.5
Irrigation/Watering	100.0	0.0	0.0	0.0	0.0	0.0	100.0	15.9
Weeding	85.4	1.0	1.7	0.2	4.6	7.1	100.0	15.4
Harvesting/Threshing/Drying	79.0	1.6	3.1	0.0	3.5	12.8	100.0	29.9
Packaging/Transportation	90.7	0.4	0.0	0.0	7.6	1.3	100.0	1.6
Others	100.0	0.0	0.0	0.0	0.0	0.0	100.0	3.6
Total	78.6	1.0	4.8	0.5	6.4	8.6	100.0	100.0
Jati								
Land preparation	46.6	36.0	0.0	0.0	15.3	2.1	100.0	19.5
Seeding/Transplantation	77.9	13.8	0.0	0.3	6.5	1.5	100.0	9.8
Fertilizer/Pesticide application	94.8	1.7	0.0	0.0	3.5	0.0	100.0	3.7
Irrigation/Watering	100.0	0.0	0.0	0.0	0.0	0.0	100.0	0.2
Weeding	51.5	35.9	0.0	0.0	8.1	4.6	100.0	23.6
Harvesting/Threshing/Drying	88.4	5.7	0.0	1.1	3.5	1.3	100.0	40.5
Packaging/Transportation	76.2	0.7	0.0	23.2	0.0	0.0	100.0	1.4
Others	100.0	0.0	0.0	0.0	0.0	0.0	100.0	1.3
Total	70.7	19.2	0.0	0.8	7.1	2.2	100.0	100.0

Source: Household survey in 2002.

Table 7. Sources of labor input on each farming operation in Planggok and Somokaton.

Type of Farming Operation	%							
	Planggok			Somokaton			Total	
	Family	Hired	Total	Family	Hired	Total		
Land preparation	69.8	30.2	100.0	13.7	63.4	36.6	100.0	14.7
Seeding/Transplanting	44.3	55.7	100.0	22.9	46.1	53.9	100.0	17.0
Fertilizer/Pesticide application	97.3	2.7	100.0	5.4	99.1	0.9	100.0	6.1
Irrigation/Watering	100.0	0.0	100.0	11.4	97.4	2.6	100.0	10.7
Weeding	84.7	15.3	100.0	24.7	92.9	7.1	100.0	19.9
Harvesting/Threshing/Drying	70.5	29.5	100.0	16.7	62.6	37.4	100.0	30.4
Packaging/Transportation	76.9	23.1	100.0	0.4	65.2	34.8	100.0	0.3
Others	46.4	53.6	100.0	4.9	100.0	0.0	100.0	0.9
Total	71.5	28.5	100.0	100.0	72.3	27.7	100.0	100.0

Source: Household survey in 2002.

Over half of the transplanting work is done by hired labor under *borongan* contract. The traditional harvesting system (*bawon*⁸) remains common, together with the *tebasan* system⁹. Non-family members perform 30-40% of harvesting work. Land preparation under the *borongan* system also depends on hired labor involving a tractor or buffaloes (30% of total labor for land preparation in Planggok, 37 percent in Somokaton). On the contrary, family members apply fertilizer and pesticides and practice weeding.

In Jati, where exchange labor is still important, 36 percent of labor inputs for land preparation and weeding are done by *krubutan*. *Prayaan* is used for various operations, particularly for transplanting (28.6%) in Watugajah and for land preparation (15.3%) in Jati. In Watugajah, hired labor performs a significant proportion of land preparation (18%), fertilizer/pesticide application (12.8%), and harvesting (12.8%). In Watugajah and Jati, forestry production, which includes timber and firewood, still contributes a considerable proportion to farming income. The share of exchange labor for forestry production in Jati is also substantial. It is worth noting that *prayaan* and *krubutan* working groups still play an important role, contributing 27.4 and 7.0 percent, respectively, to total labor activities. In both areas, the largest proportion of labor input for forestry production is pruning.

Categorization and Principles of Labor Institutions

Analyzing major characteristics of each institution allows us to define categories of labor institutions in the hamlets surveyed. This categorization involves at least four dimensions: (1) purpose, (2) timing of reciprocity (immediate, short-term, and long-term reciprocation), (3) strictness/equality of reciprocity (equal or unequal), and (4) compensation including money, labor, social validation, and benefits drawn from public goods (Table 8).

Table 8. Categorization of labor institutions in rural Java.

Name of Labor Institutions	Purpose		Timing of Reciprocity			Equality of Reciprocity		Type of Reciprocations		
	Public	Private	Immediate	Short-term	Long-term	Strict	Non-strict	Labor	Money	SV, B
<i>Gerakan</i>	+			(+)	(+)	(+)	(+)			+
<i>Gugur</i>	(+)									+
<i>Gunung</i>		(+)			+		+	+		
<i>Rewang,</i>	(+)									+
<i>Layatan</i>		(+)			+		+	+		
<i>Sambatan</i>		+			+		+	+		+
<i>Krubutan</i>		+		+		+		+		
<i>Gantian</i>		+		+		+		+		
<i>Prayaan</i>		+		+		+		+	+	
<i>Buruh</i>										
<i>Upahan</i>		+	+			+			+	

Note: + = existence , (+) = existence in more than one sub-category, SV = social validation, B = benefit drawn from public goods

Based on the framework of purpose, the institutions can be classified into three groups. The first group is *gerakan*, which provides public goods to the community. It is widely considered to be a collective action. The second group is an institution that seeks to satisfy public needs through such

⁸ This refers to the system in which community members can participate freely in rice harvesting (Hayami and Kikuchi, 1986).

⁹ This refers to the system in which farmers sell standing crops to merchants who employ harvesting workers irrespective of where they live (Hayami and Kikuchi, 1986).

activities as *gugur gunung*, *rewang*, and *layatan*. In application of *gugur gunung* activity for emergency cases, villagers expect other community members to voluntarily give assistance to the victims; in this way, villagers consider that their institutions are not only for private but also for public benefit. For ceremonial events, villagers expect that all members will behave naturally; in this case, the institution is considered to meet not only private interest but also public interest. The third group is institutions for purely private purpose such as *sambatan*, *krubutan*, *gantian*, *prayaan*, and *buruh upahan*. The activities of these institutions typically occur within the framework of contracts.

With regard to the timing of reciprocity, the analytical framework can be extended from immediate, short-term, and long-term. In the case of immediate reciprocity, reciprocation is given or received immediately after the work is completed. Short-term reciprocity is on the time scale of one month to one year. Long-term reciprocity takes on the order of several years. The institutions can be classified into three groups based on the timing of reciprocity. The first group is an institution in which reciprocation can be either short- or long-term; this is the case of *gerakan*. Villagers can use public goods in the short-term or long-term. The second group includes institutions in which the reciprocation is long-term: *gugur gunung*, *rewang*, and *layatan*. Reciprocation can take quite a long time, since many villagers believe that contributions should be compensated over several years, sometimes even through generations. The third group is institutions in which reciprocation is short-term, such as *krubutan*, *gantian*, and *prayaan*. The fourth group is an institution in which reciprocation is guaranteed to be immediate: *buruh upahan*.

Institutions can be categorized based on whether equality of reciprocation is strict (equal) or non-strict (unequal). This leads to three groups of institutions. The first group is an institution in which reciprocity can be either short- or long-term, as in the case of *gerakan*. Villagers may use public goods in a way that reflects their sense of balance between contribution and reciprocation; nevertheless, in some cases, villagers intentionally use more than their contribution, which is the case of free riders. The second group is institutions in which reciprocation is likely to be non-strict: *gugur gunung*, *rewang*, and *layatan*. If community members do not use the labor institution, this means that they only contribute but do not receive reciprocation, or that the contribution is not equal to the reciprocation. The asymmetry between give and take is likely to be accepted with generosity. The third group is institutions in which reciprocation occurs strictly within the framework of a contract, such as *sambatan*, *krubutan*, *gantian*, *prayaan*, and *buruh upahan*. The practice of *sambatan* constitutes an exception, since reciprocity is less strict, primarily in the case of poor families: such families are not required to return an equivalent amount to those that give support to them.

Institutions can be classified into three groups based on reciprocation types. For several institutions--*krubutan*, *gantian*, *sambatan*, *gugur gunung*, *rewang*, and *layatan*--contribution is compensated by labor. The type of compensation for hired labor is cash. Interestingly, for *prayaan*, compensation consists of both cash and labor. Regardless of the type of compensation, all the participants in labor institution activities receive meals. In some institutions oriented to meet purely public interests or a mixture of public and private interests, the reciprocation type is also in a particular form of social validation¹⁰. Those institutions include *gerakan*, *gugur gunung*, *rewang*, *layatan*, and *sambatan*. In the case of collective action or *gerakan*, rural people may contribute labor, money, or construction materials as reciprocation depending on the form of social validation and the benefits available from public goods. Members who do not contribute to collective action receive a penalty, which can vary from a cash fine, a strong caution from community leaders, and social sanctions such as malicious gossip or even expulsion for severe offenders.

¹⁰ Active contributors to collective action receive social validation from community members. This validation need not involve financial gain, and it is sometimes referred to as socio-emotional goods (Robinson and Flora, 2003).

Whether social norms or contracts drive the reciprocity mechanism strongly affects the type and equality of reciprocation. The institutions that govern based on social norms usually have specific mechanisms to discipline the offenders. Appropriate contributors receive social validation, whereas offenders and free riders receive various social sanctions. For the institutions that govern on a contractual basis, the consequence of breaking rules or contributing unfairly is termination of the contract. The direct consequence for offenders is difficulty in recruiting labor for various activities, from the perspective of employee who violates a contract, the consequence is difficulty in finding work; in this way, terminating a contract is regarded as a type of sanction.

The institutions oriented toward the public good, such as *gugur gunung*, *rewang*, and *layatan*, can be considered as a type of informal insurance or risk-sharing strategy¹¹. The contributions of people can be understood as a kind of premium¹² or social investment in this social insurance system. They should contribute even though they cannot expect reciprocation unless they face emergency events or otherwise require assistance.

Changes in and Continuity of Labor Institutions

The daily practices of labor institutions have been changing significantly. Villagers in the most remote hamlet, Jati, are still practicing all of the labor institution types. Watugajah, in contrast, is experiencing a transition. In general, villagers in Plangok and Somokaton have the most favourable agricultural resources, highest access to upward mobility and job opportunities, and relatively weak social relationships. Villagers in Watugajah have the medium condition of the factors. On the contrary, villagers in remote hamlet Jati have the most unfavourable resources and lowest access on mobility and job opportunities but they have the strongest social relationship. In contrast, in the lowland areas of Plangok and Somokaton, market economy penetrates massively, causing a remarkable decrease in labor institution practices (Table 9).

Table 9. Persistence of labor institutions in four surveyed hamlets.

Labor Institutions	Research Sites			
	Plangok	Somokaton	Watugajah	Jati
<i>Gerakan</i>	+	+	+	+
<i>Gugur Gunung</i>	+	+	+	+
<i>Rewang/Layatan</i>	+	+	+	+
<i>Sambatan</i>	+	+	+	+
<i>Krubutan</i>			+	+
<i>Gantian</i>	(+)	(+)	+	
<i>Prayaan</i>			+	+
<i>Buruh upahan</i>	+	+	+	+

Source: Interviews in 2002

Note: + = the persistence of the labor institution, (+) = disappearance of the labor institution

The characteristics of agricultural resources, mobility access, expansion of job opportunities, and social relationships play important roles in defining the types, persistence, and changes in labor

¹¹ Rural poor in Asian countries are usually vulnerable to various potential risks, thus they have developed various risk-coping strategies (Balisacan and Fuwa, 2007).

¹² To maintain the effectiveness of community-based safety nets, all the community members must contribute appropriate insurance premiums based on the principle of reciprocity dictated by custom and norms (Hayami, 2006b).

institution practices. The following discussion explores these factors in greater detail. Collective action for maintaining public infrastructures is organized more often in upland hamlets where roads paved by soil and stone are easily damaged during the rainy season. In lowland hamlets, where the opportunity cost of labor has become more expensive, community members contribute either by participating in the work and by contributing food, construction materials, or money. Social sanctions against absent members in the forms of malicious gossip, excommunication, and expulsion remain heavier in Jati and Watugajah, which reflect the tight structure of these communities. Indeed, the cohesion of the communities in Planggok and Somokaton seems to have weakened because of increasing employment in off-farm activities.

In Jati and Watugajah, where most of the land is mountainous, farmers usually grow big trees to provide construction timber in compounds surrounding the house. In addition, housing settlements are located in steep areas. These conditions carry some risks, and the probability of natural disasters is high. Hence, villagers still value the existence of institutions linked to coping with emergencies. It is common for community members to offer assistance spontaneously in any emergency. During the last decade the frequency and labor-intensiveness of ceremonial activities has changed significantly. In particular, the duration of ceremonies in all hamlets has become shorter and simpler, such that marriages last only one day. In Planggok and Somokaton, womens' contributions to cooking and serving guests have decreased, and it has become common for the host family to employ hired labor for the ceremony. Most respondents said that they expect this tendency to become much more pronounced in the future.

Sambatan is reciprocal aid between neighbors, but its reciprocity is more flexible than typical exchange labor. The client family is not expected to provide immediate compensation to their assistants and neighbors, and strictly equal compensation is not required. Moreover, the frequency and importance of *sambatan* has decreased with the increase of non-agricultural job opportunities. In Planggok and Somokaton over the last 15 years, hired labor has taken over some activities formerly carried out by *sambatan*.

Krubutan activities still play an important role in Jati and Watugajah, particularly during the busy rainy season, whereas the practice has disappeared in Planggok and Somokaton. This disappearance can be attributed to the latter two hamlets' better access to the city center. In fact, the number of joint activity groups and the amount of their activity has declined even in Jati.

According to the respondents, while some *gantian* groups existed in Planggok and Somokaton until the 1960s, the system has since been replaced by a type of contractual hired workers (*borongan*¹³). This suggests that hired labor took the place of exchange *gantian* labor in the early 1970s in Planggok and Somokaton. In contrast, people in Watugajah still need *gantian* for farming operations in order to accomplish the necessary work in the brief window during the busy rainy season without having to pay cash wages. Respondents explained that *krubutan* and *gantian* presented several advantages compared to individual and family labor. First of all, farming operations can be finished within a limited time, which is desirable under unfavourable water conditions, particularly in a rain-fed area like Jati. Theoretically, group work and family labor involve similar total labor inputs. For example, in the case of a *krubutan* group with five members, a client member can benefit from the work of five people on a certain day, but he or she must do group work on the other members' fields on the remaining four days. After one rotation, therefore, a member's acceptance of total labor is the same as his or her contribution to other members. Respondents, however, emphasized the positive effect of group work for fostering the working spirit, which would be very important in the area where farming operations must be finished within a strict time frame. Of course, it cannot be ignored that group work has certain disadvantages as well. The most important

¹³ *Borongan* is a labor contract in which the payment is based on acreage of land as a unit, not on hours worked.

disadvantage is the negative effects caused by opportunistic behavior of group members. However *krubutan* and *gantian* have a mechanism that can reduce the amount of free riding. The close and continuous relationship among the few members is likely to prevent them from behaving opportunistically. Nevertheless, we have to admit that the changes in labor institution has substantially influenced group projects as a result of increasing non-farm job opportunities.

Prayaan activity remains common in Jati and Watugajah, but it has disappeared completely from Planggok and Somokaton. In Jati, the groups still maintain a tight structure, and they are employed as a full group. In Watugajah, in contrast, *prayaan* can be used more flexibly by subdividing the members into smaller groups. Group leaders accept orders and arrange the schedule of operations by giving equal labor opportunities to all members. Net income of each group is calculated once a year and divided among members according to their labor contribution. Almost all groups have a rule to separate a certain portion of income for group benefits, such as loan funds to members, kitchenware for leasing, etc. This distribution system clearly shows the group-oriented characteristics of *prayaan* activity.

In lowland hamlets, hired labor has commonly been used for farming operations for a long time. In the transitional hamlet of Watugajah, hired labor is used for limited farming operations. Villagers who have difficulties in exchanging labor (widows, elderly, civil servants, teachers, etc.) began to employ hired laborers even though this remains limited in scale, restricted to rice-planting and woodcutting. In contrast, hired labor remains uncommon in the upland and remote hamlet of Jati. As mentioned above, exchange labor is much more important than hired labor, especially in this remote area.

With the development of the market economy, farmers become aware of the opportunity costs of labor. As a result, they have begun to behave as economically rational and have pursued their self-interest to a greater extent. Thus the motivation of farmers to join reciprocal types of labor institutions tends to decrease sharply with time. As shown by the example of Planggok and Somokaton, hired labor has replaced exchange labor institutions.

Opportunistic behavior is the principal factor that can create disadvantages for group work. The institutions of labor exchange rely on the following mechanisms to prevent such opportunistic behavior from harming group activities: (1) limited membership of a group, (2) close daily contact among neighbors, and (3) overlapping kinship and neighborhood relations. Limited membership of groups is a crucial factor for solving the problem of cooperation. A small number of group members allows direct monitoring, peer monitoring, and tracking of personal reputation. These strategies are essential for controlling moral hazard among members. Close daily contacts and overlapping relationships among group members are referred to as closure of social networks. The closure network is very effective for sustaining cooperative behaviour. Closeness and overlapping relationships among villagers may determine the cohesiveness of the social structure and in turn encourage the effective application of a social sanction system.

Even in Planggok and Somokaton, areas with easy access to urban centers, kinship relations remain tight, especially for ceremonial purposes. Exchange labor for farming operations, however, has been replaced completely by hired labor in both hamlets. The four hamlets studied in the present research reflect different stages in the transition of labor institutions. The impact of the market economy is likely to weaken the stabilizing function of the rural community. But the process will not be so simple. For example, people in Jati invented a quite unique labor institution, *prayaan*, which combined the principle of market economy with that of a non-cash economy. Therefore, although the penetration of the market economy into isolated areas cannot be prevented, mechanisms of mutual support practiced by rural people from generation to generation can still slow the socially destabilizing effects of the market.

CONCLUSION AND RECOMMENDATIONS

A novel categorization of labor institutions in rural Java has been studied using an analytical framework based on (1) purpose, (2) timing of reciprocity (immediate or long-term reciprocation), (3) strictness or equality of reciprocity (equal or unequal), and (4) type of compensation or reciprocation (money, labor, social validation, and benefits drawn from public goods). In general, labor institutions are conducted and maintained under the principle of reciprocity. The ways of applying the reciprocal principle can be simplified into two categories: (1) reciprocity based on social norms, and (2) reciprocity based on a contractual arrangement.

Practices of labor institutions in rural Java have been considerably changing. The changing process has been more dramatic in lowland area. In the hilly areas of Gunung Kidul District, various types of labor institution for mutual assistance still play an important role, especially in farming operations. Share of labor from labor exchanges to various farming operations is still considerably prominent. Some factors such as agricultural resources favourability, mobility access, job opportunities and tightness of social relationship have been influencing the changes and sustenance of labor institutions practices. In contrast, in lowland areas which commonly holding more abundant resources, greater mobility and access to job opportunities, and weaker social relationships; labor institutions for mutual assistance tend to decline.

Villagers in upland areas where scarcity of resource endowments is much higher and geographic isolation is more persistence, full-use of labor institution's practices for daily needs will be constantly important. Functions of labor institutions covering various activities consist of both farming and non-farming events. In rural lowland areas, despite that market economic activities are part of the whole aspects of community life, functions of labor institutions are still considerably important for villagers at least for coping emergency, ceremonial and house construction activities.

The functions and performance of labor institutions supporting rural community life in rural Java as discussed in this study to some extent also indicate the advantage of community functions as social safety net system. Villagers in the rural area which are commonly facing various risks and high uncertainty may full-use and strengthen the practices of labor institutions to overcome those problems.

The author firmly believes that this paper can be an important first step towards future comprehensive analysis on the functions of labor institutions in rural communities. In-depth study on each institution with regard to functions, arrangement mechanism, influencing external and internal factors, supplementary and complementary among institutions will be important topics for the next study.

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