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## Transformation of Labor Exchange Arrangements in an Agrarian Community of Rural Java, Indonesia

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**Abstract:** The study has been focused on the transformation process and the influencing factors of the changing of labor exchange arrangements which have been practiced among agrarian communities in rural Java. Practices of labor exchanges in rural Java have been experiencing the transformation process. In lowland areas, the expansion of off-farm jobs and technological changes in rice cultivation has deteriorated labor exchanges; labor exchanges have been almost totally replaced by hired labor. Meanwhile, in the uplands, with limited job opportunities and the introduction of mixed cropping, which demands collective work, labor exchange practices for various farming operations have strengthened considerably. Under geographical limitations and technological changes of mixed cropping system in upland areas, those have stimulated villagers to intensify traditional collective work arrangements such as *sambatan* and *krubutan*, which to some extent has been supplemented by the newly invented institution *prayaan* for completing farming and non-farming activities. The basic structures of the social relationships among villagers both in the upland and lowland hamlets bring about fewer difficulties in the arrangement of collective work for non-farming activities. However, villagers' division of labor and diversification of income sources may enable well-off households to build modern houses, a process that will likely reduce the need for collective work in the future due to its need for highly skilled labor. Altruistic behavior in house construction is still very common among villagers in the uplands; in contrast, it has gradually disappeared among richer households in the lowland area.

**Key words:** Transformation, labor, exchange, community, rural, Java

### INTRODUCTION

Principles of solidarity and reciprocity have been practiced by communities everywhere for supporting basic daily activities. Some studies have reported that labor exchange practices under principles of solidarity and reciprocity have been widely used by villagers in Asian and African countries. Koentjaraningrat (1961) studied *gotong royong* among Javanese villagers. Suehara (2006) studied the labor exchange system in rural Japan known as *yui* and the system practiced by the Congolese in Africa called *lilikimba*. Tsurata (2005) reported on the practice of traditional labor exchange in rural Thailand called *ao raeng*. In addition, Tilakaratne and Somaratne (2002) studied labor exchange in rural Sri Lanka known as *attam*.

In a broader sense, labor exchange is characterized by mobilization of labor under a rotational system among involved parties. As noted by Gilingan (2002), labor time

is traded reciprocally without pay, with the possible exception of a mid-day meal. Suehara (2005) found that, in an exchange system, every receiver of labor must return to the giver the same amount of labor.

Labor exchange is one category of labor institution systems that has been extensively practiced by community members in rural Java under a broader term of *gotong royong* spirit. An empirical study by Subejo and Iwamoto (2003) on *gotong royong* practices in rural central Java displays nine institutional categories based on the analytical framework of function and purpose, timing and strictness of reciprocity and type of reciprocation.

Labor exchanges practices have changed considerably over time. As reported by some studies with regard to changes in labor exchange practices (Koentjaraningrat, 1961; Hayami and Kikuchi, 1986; Gilingan, 2002; Suehara, 2005; Tsurata, 2005), the changes' main influencing factors have included labor



market expansion and technological change in farming operations. Labor exchange practices have experienced considerable transformation process.

Regarding relations between labor market development and labor exchange in rural Java, Subejo and Iwamoto (2003) contend that farmers have become aware of the opportunity costs of labor and have begun to behave more economically rationally and pursue their self-interests to a greater extent. Thus, the motivation of farmers to join a reciprocal type of labor institution tends to sharply decrease with time. As shown by the case in the lowland area where labor markets develops rapidly, exchange labor institutions have been replaced by hired labor. Meanwhile, labor exchange practices are still highly regarded among villagers in the upland area where the development of the labor market has been more limited.

The influence of the labor market on the change in labor exchanges also occurred in the case of rice harvesting in rural Java. Research on rice harvesting systems in rural Java reported that there are two types of bawon systems in the lowland irrigated area of rural Java (Kikuchi, 1981; Sturgess and Wijaya, 1983). The first type is the most traditional, where anyone in the village is allowed to take part in harvesting and farmers cannot limit the number of harvesters who participate. The second type is new and a modification of the first type; harvesting participants are strictly limited to people who perform extra services without pay such as transplanting and weeding. Later, the second type also changed remarkably into a hired labor system under the tebasan system.

The change from free access harvesting to more strict or limited access has been stimulated by economic considerations. From an economic perspective, it is strictly related to the labor market. Under increasing population pressure both inside and outside the village and due to the lack of farming resources, villagers in rural areas have been crowded out by very limited job opportunities. Villages experienced a lack of labor market development, and, therefore, opportunities narrowed. As the number of harvesters rose beyond a certain point, significant losses occurred due to physical damage such as trampled crops, as well as from cheating and stealing. There was an incentive for hosts to restrict the number of harvesters. Only people who had contributed with extra services such as transplanting and weeding were allowed to join the harvesting.

The impact of technological changes in farming may have possibilities for either weakening or strengthening labor exchange practices. Technological changes in rice cultivation usually tend to weaken demand for labor exchanges. As noted by Squires and Tabor (1991),

remarkable technological changes in rice production in Indonesia were experienced during the 1970-80s under the green revolution program. Schwezer (1987) even noted that the initial pilot project for introducing the green revolution in Java was started in the 1960s. Technological changes were implemented by the introduction of farming inputs, rice mills, hand tractors and harvesting systems.

Sinaga (1978) reported that the introduction of tractors had the possibility of resulting in serious losses in employment opportunities for traditional laborer. With regard to the harvesting system, stated that the new system permits the use of the sickle, it is thus reducing the number of workers needed. Since 1970, the traditional system of rice harvesting under the restricted-bawon system of harvesting with the ani-ani (hand knife) has been rapidly replaced by a system called tebasan where farmers sell their standing crops to middlemen called penebas at some time before the harvest. The contractors are usually free from the traditional obligations of the village community and they can employ smaller numbers of regular workers who usually have patron-client relationships. Typically, they pay cash wages or in kind to the laborers and use sickles for higher efficiency. In this way, the cost of harvesting is reduced. Tebasan is also regarded as a system that permits strengthening control over the number of harvesters to an optimum level.

Even though, generally speaking, modernization forces such as labor market development and new technology tend to weaken village community institutions including labor exchange, Gilingan (2002) theorized the possibility of the survival of labor exchanges even as markets develop. Technological considerations relating to teamwork dominate the decision to use exchange labor and demand for this situation will be closely related to the characteristics of local production (e.g., crop choice, water use) and may persist even as the market develops.

Interestingly, the introduction of technological changes for dry land farming in the upland area, which is generally characterized by the involvement of collective work rather than individual work, as in case of the lowland area, likely has strengthened the practices of labor exchanges.

Technological farming changes in the uplands have been saliently introduced by a mixed cropping system, locally called tumpang sari, between biennial (food crops) and perennial (wood tree) crops. In the upland areas under serious erosion impact, the introduction of a tree cropping system has been considered (Filius, 1997). The introduction and spread of a mixed cropping system in the upland areas generally demands collective work for several activities such as for terrace field construction,



activities related to timber and firewood, manure transportation, etc. The new farming system requires collective working institutions. To adapt those technological requirements, villagers make use of community structures such as social relationships.

Rural communities have certain capabilities in adapting and adjusting the practices of the old institutions to the influences of external factors. The community factor, particularly social relationships including kinship, neighborhood and friendship, has played an important role for responding to the changes caused by external factors.

Cox (2008) argued that households in developing countries depend on friends and relatives for their livelihood and sometime their survival; help exchanged within kin networks affects the distribution of economic well-being. Tsurata (2005) and Zeitlin (1991) found that in rural communities most villagers depend on relatives and close neighbors (often overlapping) in establishing family support systems. As analyzed by Jay (1969), Javanese villagers developed both kin and non-kin relationships as support systems. Villagers develop a positive sense of support that comes from frequent daily interaction and from a sense of mutual trust and obligation.

In short, it is noted that external factors such as labor market expansion and advances in technology for farming operations have caused the deterioration of labor exchange practices in many communities. However, the process is likely not so simple. Villagers, as individuals and as parts of a community embedded in social relationships, have the capacity for transforming old traditional institutions into new modified institutions that give them advantages. By considering the influencing factors such as labor market expansion, technological changes and social relationships, this study has focused on the transformation process of labor exchange practices among agrarian communities in rural Java.

## **MATERIALS AND METHODS**

Field research was conducted in 2002 and 2008 covering four hamlets of the rural area in Yogyakarta Province that were selected for their different social, economic and geographic conditions. The following hamlets were studied: Planggok and Somokaton in Margokaton Village of Sleman District in Northwest Yogyakarta, Watugajah in Girijati Village and Jati in Gircahyo Village of the Gunung Kidul District in Southern Yogyakarta. The two former hamlets represent lowland hamlets and the latter two hamlets represent upland hamlets.

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 (2006) as the face to face interview. The interview was done with selected households and community leaders such as hamlet heads and neighborhood chiefs. Focus group discussions which by Gibbs (1997) termed as Focus Group Research has been applied in this study. Focus group discussions in principle 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.

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% 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. Focus group discussions 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.

## **RESULTS AND DISCUSSION**

**General condition of research sites:** Field research was conducted in Yogyakarta Province central part of Java Island (Fig. 1). Four hamlets with different social, economic and geographical conditions have been selected as research sites (Table 1).

Water availability and soil conditions are important aspects of the research sites' physical conditions. Water availability is greater in Planggok and Somokaton, so farmers there enjoy relatively better conditions. In





Fig. 1: Map of research site

Table 1: General conditions at the research sites

Site and conditions	Research site (hamlet)			
	Planggok	Somokaton	Watugajah	Jati
Village	Margokaton	Margokaton	Girijati	Giricahyo
District	Sleman	Sleman	Gunung kidul	Gunung kidul
Area condition	Lowland	Lowland	Upland	Upland
Type and structure of land	Clay, flat	Clay, flat	Clay/limestone, terraced	Limestone, terraced
Distance from city center (km)	10	10	32.4	40
Road condition	Asphalted	Asphalted	Asphalted/traditional	Traditional
Transportation facilities				
Public	Small car	Small car		
Private	Motor bike/bicycle	Motor bike/bicycle	Small buss/truckmotor bike	Truck/motor bikemotor 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	-	-
Average size of farmland (ha)	0.32	0.14	1.28	1.10

Source: Village data in 2002

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. Whereas 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 can generally 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.

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 marketplace 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. Thus, the hamlet of Jati has been separated from the outside world for many years and this has likely contributed to the persistence of older types of labor institutions.

The socio-economic situation has played a considerable role in determining community life and structure in rural Java. The basic community structure can be approached by using an analytical framework on household economic and social structures.

**Economic structure of households:** The role of landholding in general has been important in representing the household economic structure in agrarian communities. Here, we will highlight the landholding structure in the surveyed hamlets. As described earlier, the condition of the surveyed hamlets can be divided into two general categories, namely upland and lowland hamlets.

Resource holding in the hamlets is based on land ownership. The average of land ownership in upland hamlets is far larger than in the lowlands, with a proportion of 1.29 and 0.34 ha, respectively. The type of land in the upland area is dry (73.8%), where villagers apply a mixed cropping system. In the lowlands, villagers depend on wet land (77.4%), even though it is very small in size, where they can grow paddies 2-3 times a year. Under high rates of farming land ownership, the demand



Table 2: Average and stratum of landholding in lowland and upland hamlet

Land holding type and stratum	Unit		Proportion (%)	
	Upland	Lowland	Upland	Lowland
<b>Land holding types (ha/HH)</b>				
Wet land	0.21	0.26	16.1	77.4
Dry land	0.95	0.02	73.8	4.6
Home garden/compound	0.13	0.06	10.1	18.0
Total	1.29	0.34	100.0	100.0
<b>Landholding stratum (ha) (HH unit)</b>				
0.00-0.50	20.00	48.00	33.3	80.0
0.51-1.00	9.00	11.00	15.0	18.3
1.01-1-50	9.00	1.00	15.0	1.7
1.51-2.00	10.00	0.00	16.7	-
>2.00	12.00	0.00	20.0	-
Total	60.00	60.00	100.0	100.0

Source: Sample household survey in 2002

for farm labor in the uplands is also high. This also means that mobilization of labor is very important for villagers (Table 2).

More strictly, categorizing household land ownership based on land stratum indicates that a large proportion of villagers in the lowland hamlets have very small-sized pieces of land (about 80% of villagers have less than 0.50 ha of land).

As is typical of farming areas, the household economic structure is considerably characterized by a farm land owning structure. However, in the area where population mobility and off-farm job opportunities are widely available, the composition of land holding likely does not represent the structure of household income.

Analysis of the farm household economy is mainly focused on type of agricultural production. Agricultural production can be approached from amount of sale and cash expenditure for agricultural production. In terms of sales value, farmers in lowland hamlets do very well, where sales of catfish account for 73.2% of total sales. Paddy selling accounts for the second largest farming income (20.1%). On the other hand, farmers in hilly areas depend on livestock (29.4%), timber and firewood and vegetables production by proportion at 25.0 and 27.4%, respectively (Table 3).

Catfish production has been very common among villagers, especially in Planggok hamlet where irrigated water is available the entire year; this commodity was introduced in 1995 (Iwamoto *et al.*, 2003). Catfish ponds have been built side-by-side with paddy fields. It is easy to convert paddy field into catfish ponds and vice versa.

Catfish has been regarded by villagers as a profitable business with high risks. The business also requires relatively large investments mainly for pond construction, baby fish and feeding. Business risks related to catfish production include fish diseases and high price fluctuations of baby fish, feed and catfish in the market. In 2002, about 10 sample households in Planggok

Table 3: Structure of cash household income in upland and lowland hamlet

No cash income component	Upland		Lowland	
	Rp (000)	%	Rp (000)	%
<b>Agricultural product sales</b>				
Paddy	20	0.7	1,771	20.1
Other crops	829	27.2	290	3.3
Fruit	278	9.1	77	0.9
Timber/Fire wood	756	24.8	0	-
Home garden	274	9.0	90	1.0
Livestock 892	29.3	139	1.6	
Fish	0	-	6,462	73.2
Total agricultural sales (a)	3,049	100.0	8,830	100.0
<b>Agricultural cash expenditure</b>				
Seed	92	27.2	46	0.6
Fertilizer	22	6.4	450	5.4
Pesticide	0	-	44	0.5
Irrigation	0	-	0	-
Farm tool (repairing)	2	0.4	3	0.0
Feed for livestock	0	-	10	0.1
Fish production *)	0	-	6,826	81.3
Tax	15	4.3	19	0.2
Hired labor	186	54.9	354	4.2
Machine and animal	0	-	191	2.3
Cash rent	23	6.7	448	5.3
Total agricultural cash expenditure (b)	339	100.0	8,392	100.0
Agricultural cash income (1) = (a-b)	2,710		439	
Income ratio (c) = (1/a*100)		88.9		5.0
<b>Non-agricultural cash income</b>				
Agric. wage labor	180	8.1	350	5.0
Non-agric wage labor	229	10.3	778	11.1
Trading 481	21.5	1,740	24.8	
Artisan	329	14.7	500	7.1
Transportation	0	-	180	2.6
Gov. officer	0	-	930	13.3
Household industry	0	-	778	11.1
Remittance 515	23.1	811	11.6	
Rent income	499	22.3	518	7.4
Others 0	0.0	417	6.0	
Total non-agricultural cash income (2)	2,234	100.0	7,002	100.0
Total cash income (3)=(1+2)	4,944		7,441	

Source: Sample household survey in 2002. \*Fish production includes expenditures for hired labor, baby fish, feeding and medicines

hamlet experienced losses from the catfish business, varying from Rp.0.18-6.7 million in a year. By contrast, the most successful farmer made a net profit of about Rp.13.0 million in a year.

As compared to the lowlands, agricultural cash expenditure in the uplands has been far smaller. The main expenditures are hired labor (54.9%), followed by fertilizer (27.2%) and cash rent (6.7%). Farming expenditures among farmers in the lowlands have predominantly resulted from catfish production (81.3%), followed by fertilizer (5.4%) and cash rent (5.3%).

Clearly, there is a sharp contrast between lowland and hilly areas in terms of composition of farming cash expenditures. In the lowlands, the income ratio (ratio of net income to gross income) is relatively low, at only 5.0%. Consequently, the proportion of agricultural net income in the lowlands is far smaller than that in upland hamlets (88.9%). Concerning the composition of total cash income, the income share of agricultural products is predictably low in lowland hamlets (6.3%) where major



income sources are non-agricultural wage labor, work in the public sector, trading and self-employed occupations (carpenters or masonry). The substantial contributions of remittances from family members are also pronounced.

Villagers in hilly areas with limited access to off-farm jobs are still highly dependent on agricultural production. Over half of total household incomes in upland hamlets are earned through agricultural production (54.8%). Artisan-type jobs (carpenters or masonry) are also very important in both hamlets. Trading is the most common business for rural women, where long working days are rewarded with a low daily return. Remittances also contribute substantially.

With regard to the level of commercialization, the process has likely been more pronounced in lowland areas and is especially evidenced by the selling of staple food crop-paddy. The rate of paddy selling in upland hamlets is far lower, on average Rp.0.02 million (5.4%), as compared to that in lowland hamlets, on average Rp.1.77 million (85.1% of total production).

**Social structure:** With regard to social factors, the attention is mainly focused on the strong kinship relations among villagers. In order to fulfill daily needs, villagers in general are closely interdependent on their neighbors and relatives. Kinship ties overlap considerably with neighborhood relations. Mutual help among relatives has been practiced from generation to generation, especially in finance, labor exchange and ceremonial (slametan) activities. Jay (1969) stated that the villagers consider the presence of a guest crucial to the ritual; the guest helps ensure its efficacy by witnessing its performance as one witness a legal document. The concept of slametan is that of a placid existence coming from the absence of troubles and obstacles.

Concerning the overlap between neighborhood and kinship relations, the proximity of living locations enables

relatives and neighbors to continue mutual help with fewer difficulties. Kinship relations have contributed to the strengthening of mutual ties among community members. The close kinship relations developed at the research sites, where relatives include parents and siblings of husband and wife. By definition, each household has four parents if the household has a married couple. In general, there is no remarkable difference in terms of average number of relatives among villagers in upland and lowland areas. The average number of relatives in upland and lowland areas is 10.3 and 9.9 persons per household, respectively (Table 4). A larger number of relatives who live near each other is an advantage and enables the convenient arrangement of mutual help activities.

About half (50.2% in upland and 46.7% in lowland) of parents and siblings live in the same hamlet (including those in the same house). When including those who live in the same village, the percentage increases to 70.3% for upland and 60.2% for lowland areas. In general, population mobility in both lowland and upland hamlets is relatively low. We can assume that the low mobility resulting from the proximity of living location enables relatives to continue mutual help with fewer difficulties.

The practice of inviting/being invited to ceremonies (Slametan) among parents and siblings is most common at the research sites. Both in upland and lowland areas, households usually invite each other to their slametan ceremonies at rates of 89.1 and 87.4%, respectively. Mutual help in financing has also been quite common in upland and lowland areas at rates of 82.6 and 75.5%, respectively. Mutual help in labor is also still provided among households of relatives in both upland and lowland hamlets at rates of 78.5 and 73.4%, respectively (Table 5). Kinship relations still function as a basic unit

Table 4: Kinship relations (Parents and siblings) in surveyed hamlets

Location	No. of sample households	No. of parents and siblings (both side)				Living places			
		Total	Parents	Brothers	Sisters	Same house	Same hamlet	Same village	Other villages
Upland	60	619	240	197	182	118	193	124	180
Lowland	60	595	232	177	186	85	193	80	236
		Average (person per household)				Composition (%)			
Location	No. of sample households	Total	Parents	Brothers	Sisters	Same house	Same hamlet	Same village	Other villages
Upland	60	10.3	4.0	3.3	3.0	19.1	31.2	20.0	29.1
Lowland	60	9.9	3.9	3.0	3.1	14.3	32.4	13.4	39.7

Source: Sample household survey in 2002

Table 5: Mutual help among parents and siblings in surveyed hamlets

Location	Mutual help*					
	In money (%)		In labor (%)		Invitation to slametan (%)*	
	Yes	No	Yes	No	Yes	No
Upland	82.6	15.5	78.5	19.6	89.1	6.8
Lowland	74.5	23.8	73.4	24.9	87.4	9.4

\*Mutual help among parents and siblings only to who belong to the different households. Source: Sample household survey in 2002



through which kinship members can receive mutual support for financing, farming operations and ceremonial activities.

Neighborhood is also an important source of gift-giving support among the community. As the residential proximity in rural areas is considerably high, villagers know each other well, enabling community members to conveniently provide mutual support on a daily basis among neighbors. Close living arrangements of neighbors also facilitates smooth daily contact and interaction among them. Cooperative and collective work is more likely to be persistent under a strong sense of neighborhood.

Strong social relationships are widely and strongly appreciated by the Javanese community. Schwezer (1989) noted that the Javanese community considers neighborly harmony (*rukun*) extremely important. Participation in the *slametan* and readiness to help neighbors spontaneously are thought to be suitable ways of giving this value adequate expression.

Although, commercialization, expansion of job opportunities and population mobility have clearly occurred in lowland areas, there is no remarkable difference in terms of social structure, especially in kinship relations among community members in lowland and upland hamlets. Basically, the social structure in both lowland and upland hamlets is still very strong.

**Characteristics and arrangement of labor exchanges:** A wide variety of mutual cooperation in rural Java has been realized in several types of labor institutions. As reported by a previous study on rural Java by Subejo and Iwamoto (2003), labor institutions can be simplified into two main categories based on purpose of activity: (1) public purpose and (2) private purpose. First, mutual help for public purposes includes activities for building and maintaining public facilities such as village roads, school buildings, irrigation canals, meeting places, mosques, public squares, public ponds, public graveyards and natural springs. Activities may be initiated voluntarily by villagers or as required by community leaders. Second, mutual help is provided for private purposes. The basic principle of cooperation is the spirit of reciprocity. Reciprocity can be guaranteed either in the short-term and strictly equal (strict type) or in the long-term and non-strictly equal (non-strict type). In case of strict reciprocity, reciprocation is given and/or received immediately. Long-term reciprocity reflects that reciprocation will be given or received during a longer period. Based on the type of compensation, reward or reciprocation can be categorized into three categories: (1) cash or money, (2) labor and (3) both cash and labor.

This study focused on three labor exchanges practiced by the rural community: (1) long-term and non-strict reciprocity, called *sambatan*, (2) short-term and strict labor exchange, called *krubutan* and (3) group sale of labor with great emphasis on the group member, called *prayaan*. In order to give a clear understanding, the following section describes the mechanism of the working arrangements and functions of each institution.

*Sambatan* literally means requested mutual help. It is a type of exchange labor that is characterized by long-term and non-strict reciprocity. The general function of this institution is to speed up the work and to help each other. The majority of *sambatan* activities are both non-farming and farming.

When villagers demand mobilization of labor, they will ask relatives, neighbors and or friends to provide help. In return for the labor contribution, invited persons will be served a meal that day. In addition, the household host will be ready to provide reciprocal labor support anytime it may be needed. The reciprocation will be given in the long-term, depending on the need of the participant. In *sambatan*, reciprocity is categorized as non-strict; for instance, one person probably gives support more frequent than another person. In the case of house construction, it is possible that one household already inherited a house from a parent and may not receive reciprocation if during his or her lifetime there is no reconstruction work. There is no fixed membership on the exchanged help activities. The number of invited participants depends on the scope and type of activity.

*Sambatan* arrangements are differentiated by gender. For non-farming activities, men are invited for construction-related activities, whereas women participate in meal preparation. Food served for workers during house construction is usually better in quality as the activity is regarded by villagers as a special occasion. If the number of invited participants is relatively large, the household will serve very several very good meals and the wife needs to invite neighbors or relatives to help in the meal preparation.

On farming operations, *Sambatan* arrangement between men and women are also arranged separately. Concerning meal preparation for participants, the wife usually prepares the meal in the morning, whether the host is the husband or the wife. The number of participants in a farming operation is commonly small; therefore, meal preparation can be done by the wife only. The wife and husband will bring the meal to the field to be served to the participants.

The inviting process of *Sambatan* is slightly different at each site. In the lowlands, the host family usually visits and directly requests other members, who are expected to



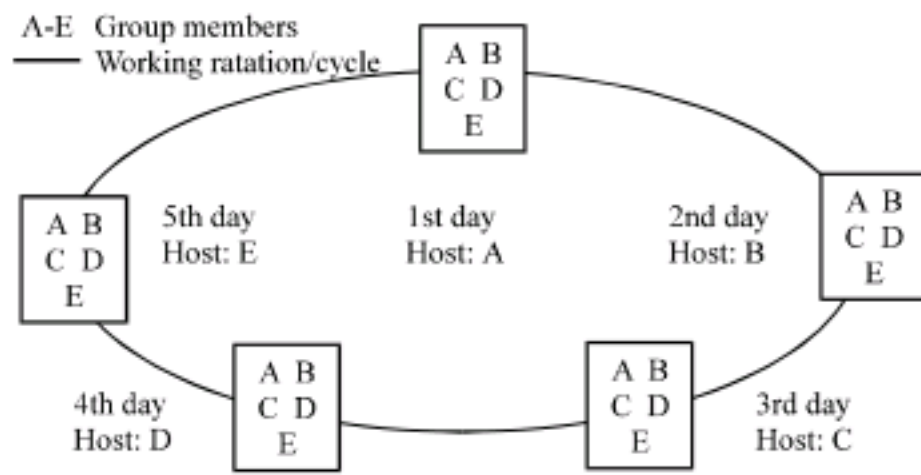


Fig. 2: Mechanism of work rotation of Krubutan

give needed assistance. In the uplands, if a host family requires a smaller number of people, the requesting process is taken over by the host directly; if it requires a larger number of people, as in case of house construction, the requesting process is taken over by a neighborhood group (Rukun tetangga/RT) chief on behalf of the host.

Sambatan for farming has disappeared almost totally in the lowlands. By contrast, villagers in both lowland and upland areas are still practicing sambatan for non-farming operations for house construction and repairs. To some extent, sambatan still continues.

The second labor exchange type is called krubutan. The literal meaning of krubutan is doing together quickly. This activity can be categorized as a general type of labor exchange. Basic principles in krubutan are strict equality and reciprocity within a certain period of time (short-term and strict, reciprocity). In daily practice, the activities of a krubutan group are usually conducted on a yearly basis. The labor group has a fixed membership and group members regularly make an agreement about the work-rotation (Fig. 2). Members of krubutan may come from closest neighbors, friends and relatives. The advantages of krubutan are mainly perceived to be mutual help for work acceleration, easing the work burden, harmonizing group members and keeping up the work spirit and motivation. Krubutan still exists only in upland hamlets.

Krubutan commonly has been important for various farming operations. Krubutan labor is also arranged separately between men and women. Concerning meal preparation, the wife usually prepares the meal in the morning, whether she or her husband is the host of the work. The number of group members is commonly small; therefore, meal preparation can be done by the wife only. The wife and husband bring the meal to the field to be served to the participants.

A high concentration of krubutan in upland hamlets can be found mainly during the rainy season. That season is the most appropriate time for farmers in hilly and

mountainous areas to grow various agricultural crops. Krubutan activity is commonly carried out in the afternoon around 12.00 am to 16.00 pm.

The third labor institution, known as prayaan, is group work like krubutan, 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.

Prayaan activities have been a newly introduced institution in upland hamlets for several types of farming operations. They were introduced around the beginning of the 1970s with the introduction of the mixed cropping system and the remarkable opportunity of agricultural product commercialization, especially firewood and timber.

The number of groups is fixed, but there is variation with regard to the number of members in prayaan groups, which varies from about 10-20. The groups are organized separately by gender. Prayaan members are usually close neighbors. Group arrangement commonly has been based on neighborhood groups where the members reside. If the neighborhood group is big enough, it may be divided into more than one group. Neighbors have no obligation to become members of such groups. However, there is a strong expectation between villagers to join groups. Villagers who have side jobs, such as trading, skilled construction work, teaching, in some cases do not join the group.

Women's groups work mainly in agricultural operations, whereas men's activities are much broader, comprising agricultural operations and plastering work. In general, the group activity is usually done once a week in the afternoon. In some cases, the frequency of activity depends on the number of order form users. The participation of members is high (80-90%) and absent members are required to pay a penalty in cash.

Prayaan labor is also arranged separately between men and women. Wives usually prepare the meal in the morning for participants. Although the number of participants is relatively high, meal preparation can be done by the wife only or may be supported by family members. Wives prepare the meals, whether they or their husbands are the hosts of work. The meal is mostly a very simple and ordinary rural meal; therefore, the preparation is simple and does not consume much time. Wife and husband bring the meal to the field to be served to the participants.

For 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. This strategy reflects strong attention to group unity and cohesiveness, maintenance of social relations and providing mutual benefits.

In order to further discuss labor exchange arrangements, the next two sections will discuss in detail labor exchanges for non-farming operations and for farming operations, respectively.

**Labor exchange for non-farming operations:** The changing process of labor exchange practice for non-farming has been clearly noted. Although, labor exchange has developed the mechanism of balancing the reciprocity and produced advantage of flexibility, the ability to adapt to the dynamically changing internal and external community conditions is newly developed.

Community members have adjusted the practice of cooperative works for house construction and repairing. The expansion of off-farm job opportunities and technological changes in house construction bring about reluctance to ask for labor support for longer periods of time. Since about ten years ago, villagers in lowland hamlets have invited labor support for house construction for a maximum of one day. If the construction work is not finished, they select and ask a certain number of laborers to continue working under a hired payment system. In the case of upland hamlets, the durability is slightly stronger; adaptation to the shift from labor exchange to hired payment system takes 2 days. The selected laborers work as support workers of hired skilled labor.

Villagers both in upland and lowland areas have used sambatan for house construction and repairs. Men are usually involved in construction work, whereas women are involved in food or meal preparation for construction work participants. The present study approached household involvement from a gender (men and women) and status (host and participant) perspective. Hosts were asked about the experiences of inviting people to provide support at sambatan events; participants were asked about the experiences of being invited to a sambatan event during the last year. With regard to gender, 37 men (61.7%) in the uplands and 43 men (71.7%) in the lowlands had been involved as hosts for sambatan for house building and repairing. Meanwhile, the proportion of women in upland and lowland areas was 9 (15.0%) and 11 (18.3%), respectively. The proportion of involved men was far larger than that of women. From a geographical perspective, villagers in the lowlands were relatively more involved as hosts of events.

Invited participants at house constructions depended on the size and scale of the construction work.

Villagers still demand labor mobilization from labor exchanges because house construction requires a huge number of labors. Men participated in construction, whereas women cooked and prepared meals for workers. Non-involved households do not necessarily perceive labor exchange work as unimportant, but have likely had no chance thus far to request exchange labor. Until the present, these villagers have not had any opportunity to build a new house or repair an old one. Houses in rural areas, including both lowlands and uplands, are usually built in the traditional style and are relatively durable; in some cases, villagers mentioned that those houses can be used for 40-50 years. Usually a long time passes before reconstruction work or rebuilding are needed after a young couple inherits a new house from a parent. Interestingly, these couples have no chance to invite people to help in their house construction.

The socio-economic condition of villagers likely has some connection with behavior during sambatan. For the analysis, households' socio-economic condition can be compared with regard to hosts who are either men-women and men only. The comparison is made through the number of invited participants and economic condition. In upland areas, the average number of participants invited in the men-women category is 6.5 men and 2.9 women, whereas the average number of invitees in the case of male hosts is only 7.4 persons. The economic situation of men-women as host is better as compared to men-only as host, with average income standing at Rp. 5.0 million/household/year and Rp.4.5 million/household/year, respectively. In terms of income per capita, men-women hosts also fare better than men-only hosts, with Rp.2.1 million/person/year and Rp.1.5 million/person/year, respectively. Looking at average landholding, the condition of men-women hosts is also better than that of men-only hosts, with 1.9 ha/household and 1.3 ha/household, respectively (Table 6).

Theoretically, since they have better economic conditions, households characterized by men-women hosts have a higher capability to invite more participants, but in fact, they invite smaller numbers of participants. In a few cases, better-off households began to employ skilled construction labor for building modern houses; therefore, demand for ordinary workers slightly decreased.

Generally speaking, for traditional-style houses in the upland area, the demand for male labor commonly is not so different; therefore, the need for female labor should theoretically be similar. Interestingly, lower income households only invite male laborers, whereas better-off households also invite women laborers.

Wealthy households felt socially obligated to provide more and better quality food to invitees. This



Table 6: Household involvement as host and on sambatan for non-farming and economic characteristic of household in upland hamlet

Involvement types	Involvement of HH		Av. of participants (person)		Average productive labors (person/HH*)	Average landholding (ha/HH)	Average of income (Rp 000/HH)	Income per capita (Rp 000/person)
	No. of HH (unit)	%	SM	SW				
No involvement (**)	23	38.3	-	-	3.7	1.09	5,444	1,605
S-men	29	48.3	7.4	-	3.5	1.25	4,545	1,483
S-men and S-women	8	13.3	6.5	2.9	3.0	1.90	4,965	2,066
Total/Average	60	100.0	7.2	2.7	3.5	1.27	4,945	1,607

Source: Primary data analysis, 2009. SM: Sambatan for men, SW: Sambatan for women; \*Productive labors are household members who live together under age between 15 and 70 years old. \*\*No involvement includes no involvement at all and involvement on farming activities

Table 7: Household involvement as host and on sambatan for non-farming and economic characteristic of household in lowland hamlet

Involvement types	Involvement of HH		Av. of participants (person)		Average productive labors (person/HH*)	Average landholding (ha/HH)	Average of income (Rp 000/HH)	Income per capita (Rp 000/person)
	No. of HH (unit)	%	SM	SW				
No involvement(**)	17	28.3	-	-	3.5	0.36	6,865	2,507
S-men	33	55.0	6.7	-	3.3	0.33	8,186	2,726
S-men and S-women	10	16.7	9.2	3.0	3.2	0.29	6,419	1,976
Total/Average	60	100.0	7.3	2.9	3.4	0.33	7,441	2,221

Source: Primary data analysis, 2009. SM: Sambatan for men, SW: Sambatan for women; \*Productive labors are household members who live together under age between 15 and 70 years old. \*\*No involvement includes no involvement at all and 1 case of involvement on farming activity

phenomenon to some extent characterizes a sort of altruistic behavior among better-off villagers in remote rural areas. Rich households tend to serve more luxurious meals for invited laborers; doing so requires additional labor for the preparation and therefore they invite female laborers. Villagers also mentioned that some better-off households have even started to build good quality houses in the modern style, which requires skilled construction labor and reduces the number of ordinary male laborers. Under lower income conditions, households categorized as having men-only hosts tend to only use women family labor for meal preparation, therefore demanding male labor only.

The pattern of household behavior for house building activities in lowland hamlets is different as compared to those in the uplands. With regard to number of invitees, the average number of participants invited in the men-women category is 9.2 men and 3.0 women. The average number of invitees in the case of men-only hosts is 6.7; however, the economic situation of men-women hosts is worse compared to men-only hosts, with average incomes of Rp.6.4 million/household/year and Rp.8.2 million/household/year, respectively. In terms of income per capita, men-women hosts also fare worse than men-only hosts, with Rp.2.0 million/person/year and Rp.2.7 million/person/year, respectively. Average landholding of men-women hosts is also slightly lower than that of men-only hosts, with 0.29 ha/household and 0.33 ha/household, respectively (Table 7).

Better-off households have been characterized by the involvement of men-only host's in house construction. Their preferences and behaviors concerning house construction have likely changed in line with the modernization process. The modernization process in lowland areas is more pronounced. This phenomenon also

prompts better-off villagers to build modern houses, which requires highly skilled construction labor. However, they still demand collective labor, even if it is just limited support on the first day of construction, at least to have a slametan ceremony and to discharge the old building. Therefore, the need for participants as ordinary workers is smaller and the support of women laborers for meal preparation is not required. The housewife herself can prepare the meal because the number of participants is small.

Interestingly, men-women hosts in the lowland area were characterized by lower economic status. This situation is in contrast to that in the upland area where men-women hosts were among the richer households. Under the restrictions of their economic condition, those in the lowland area tended to build traditional houses by inviting neighbors and relatives and minimizing the use of skilled construction labor. They still invited a relatively large number of men for exchange labor. In addition, a larger number of invited men for construction work also required additional labor for meal preparations; therefore, they also invited women to complete this task.

Although, exchange labor on house building has been changing, villagers still commonly perceive the advantage of the activity. Although Sambatan for house construction and repairing is a private interest, interestingly, the activity has broadly been perceived by villagers to some extent as a kind of public interest. Among villagers, there is common understanding and high expectation to attend the invitation, although they may never act as host. Involvement to invite and participate in the activity to some extent also represents a public interest. They are internally and externally guided to be active either as host or participant; it is not only for fulfilling private needs, but also for the maintenance of social-public relationships.



With regard to the continuation of household involvement in house building, Schwezer (1989) contended that in the Javanese community, house building and road construction have been included in the village ritual sphere. By extension, in personal and social crises calculated reciprocity (help me and I will help you) and altruistic transfer (the rich give more) occur and the community spirit is fostered at the norm level.

Altruistic behavior in house building has been well-maintained, especially among upland villagers. The villagers are still sharing a common understanding, even among rich households that can afford to use paid skilled labor only but still invite a certain number of both men and women neighbors to give support. They also serve very good meals as fulfillment of social appropriation.

Dynamic changes have been happening in the lowland area. Altruistic behavior has gradually disappeared, which is especially clear among rich households. They have started to depend on paid skilled construction labor and no longer invite women to prepare and serve luxurious meals for the participants.

**Changing process of labor exchange practices for farming:** Labor exchange practices for farming operations in the surveyed hamlets have changed distinctly. The change process is rather easy to understand from the process of technological changes in farming and of labor market expansion.

Before arriving at the new system of rice cultivation, demand for collective farm work was considerably high, mainly for land preparation, planting and harvesting. Men arranged exchange labor for land preparation including hoeing, plowing and harrowing. Women usually arranged exchange labor for rice transplanting and harvesting.

The introduction of new rice technologies in irrigated lowland areas by the 1970s has impacted labor arrangement and mobilization. The introduction of new systems, for example in transplanting, land preparing and harvesting, has reduced the demand for labor mobilization. Farming labor exchange practices have been continuously shrinking. Labor for farming operations has been largely substituted by hired laborers.

Practical new technologies such as new HYVs that require row-line planting, mechanization through hand tractor usage and usage of the sickle for harvesting instead of traditional tools have influenced labor arrangements and mobilization. The new transplanting system requires specific skills that not all women farmers have. The new method for paddy planting, called the larikan-checkrow-planting system, is an exchange labor institution that superseded the borongan-contract system by a paddy planting group, basically involving six to

seven persons. Usage of hand tractors also reduced the demand for labor mobilization. The increasing usage of sickles for rice harvesting also greatly reduced the demand for labor mobilization.

In line with rural infrastructure development in the lowlands, including rural roads, rural markets and public transportation, rural people's mobility has increased greatly. Non-farm job opportunities such as trading, construction labor and rural industries have also been increasing near villages, sub-districts and in the city districts about 5 km from the villages.

Since the beginning of the 1980s, the practice of labor exchange for farming has commonly disappeared in lowland areas; it has become very common among villagers to use hired labor for land preparing, rice planting and harvesting. Technological changes in paddy farming, expansion of the labor market and off farm job opportunities likely play important roles in the changes of labor exchange practices.

Another remarkable technological change in farming for farmers in lowland areas was the introduction of catfish production in 1995. With the excellent water availability conditions in the lowlands, mainly in Planggok, farmers can use water for both paddy and catfish productions. There has been high demand for catfish in the city center, located only about 15 km from the village. Catfish ponds have been built side-by-side with paddy fields and it is easy to convert paddy fields into catfish ponds and vice versa.

Pond construction requires labor arrangements. The arrangement of labor exchanges used to be possible, but unfortunately, since the beginning of the 1980s, the practice for farming has disappeared in the village. Reviving it would not be easy and would require high transaction costs. The construction of catfish ponds, especially for modern type/cemented ponds, requires skilled or talented labor. Therefore, farmers depend on hired labor from the labor market for the construction of fish ponds instead of the customary labor exchange.

In contrast with the lowlands, where technological changes inhibit the practice of labor exchanges, in the upland areas, the introduction of new technology has strengthened the practice of labor exchanges. A mixed cropping system in mountainous areas has also demanded collective work for several activities such as terrace field construction and repairing, activities related to timber and firewood and manure and soil transportation. In addition, villagers have also intensified livestock raising. Various activities for the above-mentioned farming operations demand a mobilization of labor. Therefore, the need for labor exchange has been steadily high.



Technological changes in farming in the uplands have occurred with the introduction of wood trees around the mid-1970s under the Land Rehabilitation Program. As noted by Filius (1997), at the beginning of the 1960s, the mountainous areas of Java such as Gunung Kidul district were almost treeless. Growing trees can be an induced innovation to help maintain agricultural productivity because they may reduce erosion and enrich the soil. By 1975, the Indonesian government formally began to seriously implement a soil conservation program under reboisasi: the Re-greening Program. The goal of the re-greening program was initially to plant trees on ridges constructed on private land. Seedlings were provided free by the program and at the beginning, the program farmers received a grant to at least cover the cost of labor for planting and maintenance.

However, the variety of food crops has not changed remarkably. There was no introduction of new technologies for upland rice production as was the case with introduction of HYVs of rice in the lowlands. The remarkable changes have occurred mainly with the introduction of wood trees. The greening program introduced the planting of wood trees in critical areas such as mountainous and hilly areas. Central and local governments provided free tree seeds and also subsidized fertilizers. Magohony, teak and acacia are some tree seeds that have been distributed in the area.

The transformation process of labor exchange arrangements on farming operations has likely occurred through the supplementary arrangement of traditional and newly introduced labor exchanges. The transformation process, in some cases, is also connected to technical problems in farming operations. Supplementing newly invented institutions is another mechanism of adjustment and adaptation to the demands of technological change and expectancy on economic interest. Although, villagers

have started to practice a newly introduced institution (prayaan), they are also still using traditional types of exchange labor such as sambatan and krubutan for various farming operations (Table 8).

With regard to the time required for work completion, farming operations can be categorized into two groups. The first group consists of operations that should be completed within a strict time frame, including land preparation, planting, weeding and harvesting. The second group includes operations that can be completed within a non-strict time frame, including terrace field construction, manure transportation and application, post-harvesting, livestock shed construction and activities related to timber and firewood.

Involvement of households as hosts of sambatan is the smallest, while involvement in prayaan is the highest (Table 8). Invitation of sambatan labor for farming operations has been flexible in terms of frequency and number of laborers. Recently, in line with improvements in the labor market and off-farm job opportunities, invitation of large numbers of laborers and frequent activity under the sambatan system has been costly from the perspective of social and economic consequences. Employing labor under krubutan is still highly regarded by villagers, especially for activities that can be done within strict time limits, such as land preparation and non-strict activities, such as terrace field construction and activities related to timber and firewood. The role and importance of prayaan in farming operations has been expressed by villagers. Prayaan practice is a kind of socio-economic adjustment for completing various farming activities. Relatively large numbers of group laborers and lower payment for group members are perceived as an incentive and advantage by members. Laborers can flexibly be used for activities needed within both strict and non-strict time frames.

Table 8: Composition of supplementary arrangement of labor exchanges for farming operations in upland hamlet

Type of farming operations	No. of involved HH as host (unit)								
	Sambatan			Krubutan			Prayaan		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Terrace field construction and repairing	1	-	1	6	3	9	16	-	16
Land preparing	5	6	11	13	14	27	12	15	27
Planting and transplanting	1	-	1	-	-	-	-	2	2
Manure transportation and application	1	-	1	-	-	-	-	-	-
Weeding	-	-	-	-	2	2	3	9	12
Harvesting	-	1	1	-	1	1	-	1	1
Post harvest/processing 1	-	1	-	-	-	-	-	-	-
Livestock shed construction 5	-	5	1	-	1	2	-	2	-
Activities related to timber and firewood **)	7	4	11	11	6	17	15	-	15
Total	21	11	32	31	26	57	48	27	75

Source: Household Survey in August 2008. \*Data of household as host on sambatan was the activity which has been experienced during the latest one year, while data of household as host on krubutan and parayaan, It was the latest experienced activity; interviewed was done in August (first dry season) which was in between the most busy season (rainy) and slack season (second dry season); \*\*Activities include cutting, collection and transportation



Several activities that need to be done within a strict time frame are adjusted in the rainy season by supplementing the usual sambatan, such as land preparing, by krubutan and prayaan (Table 8).

Planting in the uplands is commonly somewhat simpler compared to that in lowland area. Crop planting is done through the dispersal of seeds such as upland paddy and corn. The activity usually can be done by family members and the usage of labor exchange is not as frequent for planting.

Interestingly, recently the role of prayaan work for weeding activities has been very important. Villagers used to ask for sambatan labor for weeding. This activity is better done in a timely way and is characterized by delicate and time-consuming work. Weeding can be finished with a large number of participants and/or employing a high frequency of small group labor. Large numbers of laborers can be invited under sambatan labor. However, invitation of a large number of sambatan laborers for weeding has recently been perceived by villagers as not so appropriate; they reluctantly make invitations by considering the participants' opportunity costs. Frequent invitation of fewer laborers can be done principally through krubutan arrangement. It also seems not as appropriate because it takes a longer time and several rotations. Therefore, the usage of prayaan, which by nature has a larger number of laborers, is perceived to be more appropriate and provides advantages to villagers. The involvement of households as hosts for weeding has been high among women due to the delicate work involved. Such activities have been regarded among villagers as more suitable jobs for women.

With regard to harvesting, villagers usually harvest the crops gradually with family members. Crop materials such as leaf and crop stems are also commonly perceived by villagers in upland areas as additional farming products. In the uplands, timing of harvesting of main food crops such as corn, peanuts and cassava can possibly be done during a relatively longer period. Crop harvesting is also adjusted to livestock feed collection. Crop materials are important sources of livestock feed for most villagers. Harvesting of farming products, especially in upland paddies, which should be done in a relatively shorter time frame and requires collective work, alternatively may use a shared harvesting system (bawon). Large land-holding households in upland areas may invite close relatives and/or close neighbors who are facing economic hardships to help in paddy harvesting; in return for their labor, participants get a certain part of the harvested paddy, usually depending on the kind of social and kin-relationship (in general it is about one-fifth of total harvested products). Villagers have perceived this

bawon system as a social safety net through farming output sharing among certain inner circle households. The Bawon system in upland areas is different from the system in lowland areas, where people can freely take part in harvesting, or the system implemented later, where the participants are strictly limited to people who took part in crop transplanting and weeding.

Activities that are not categorized to be completed within a strict time frame, such as livestock shed construction; usually still depend on traditional work arrangements, mainly sambatan. Invitation of sambatan labor for livestock shed construction is quite similar to that for house construction. Household involvement has been high among men.

Activities that demand large amounts of collective labor within a strict time frame, such as terrace field construction and a non-strict time frame, such as repairing and activities related to timber and firewood, which used to be done by sambatan and krubutan, have recently depended considerably more on prayaan. Household involvement in terrace field construction is high among men, whereas in activities related to timber and firewood, both women and men are involved to a considerable extent. The activities usually can be clustered as hard-work type and men are perceived as more appropriate for completing those tasks. Women's activities commonly are limited to firewood collection and transportation.

In upland hamlets, the arrangement of sambatan in farming operations has been quite flexible; people can invite labor for any purpose regardless of similarity in activity. If anyone is asked to provide labor for land preparation, in return he/she will receive labor support for either a similar or different activity, such as terrace field construction, firewood transportation and others, depending on the need of the host.

A typical strict labor exchange (krubutan), which exists only in upland hamlets, has been arranged only for various agricultural operations. Interestingly, reciprocity is measured in working hours, not by similarity of activity or land size. Generally, such as is the case in rural Asia, exchange labor is based on work days of a similar activity; for instance, if A invites B, C, D and E for rice transplanting, in return, A will help the others for rice transplanting.

There have been supplementary arrangements among labor exchanges practiced by villagers for completing various farming activities. prayaan has considerably supplemented the activities required to be done in a timely manner and that need huge numbers of laborers and or delicate work. Such activities include terrace field construction and repairing, land preparing, weeding and activities related to timber and firewood. Villagers still



highly depend on traditional types of exchange labor such as sambatan and krubutan for other activities such as manure transportation and application, harvesting and post harvesting. Especially for livestock shed construction and repairs; the phenomenon is quite similar to house construction where villagers depend more on sambatan labor.

With advancing technological changes in farming, labor market improvements and more opportunities for population mobility in upland hamlets, the practice of labor exchange for farming operations will be continuously transformed to adjust to these factors.

### CONCLUSIONS

External community factors such as the expansion of labor markets and technological changes have influenced traditional labor exchange arrangements in rural Java. In lowland hamlets where the economic structure is primarily determined by non-farming incomes, under favorable geographical condition for farming practices, flexibility in population mobility and the strong impact of technological changes in farming production systems have reduced the need for collective work for various farming activities. The great influence of off-farm job opportunities also likely exposed villagers to opportunity cost. However, mutual help for non-farming is still going well.

In contrast, in upland areas where the economic structure is more determined by farming, under geographical limitations and technological changes of mixed cropping system, villagers tend to demand and intensify traditional collective work arrangements such as sambatan, which to some extent has been supplemented by the newly introduced institution prayaan for coping with basic daily needs including farming and non-farming activities. However, krubutan practices still survive, despite the practices arranged under strict rotation schedules. The smaller influence of off-farm job opportunities and labor markets due to area isolation likely also strengthen the reliance on collective work.

Transformation of labor exchange practices has occurred in both lowland and upland hamlets. sambatan, which principally has the most flexible membership and hosting practices, has been changing notably. People in upland areas are still sharing a common understanding and practicing altruistic behaviors, especially for non-farming activities such as house construction and repairing. However, they have started to supplement ordinary labor with skilled labor and also shortened invitation days for ordinary laborers to 1-2 days. Altruism to some extent has disappeared in lowland areas, as

clearly shown by the behavior of rich households. sambatan for farming has almost totally disappeared in the lowlands and its practice in the uplands has also decreased. Frequent invitation of sambatan labor is criticized among villagers and opportunity costs also stimulate feelings of reluctance among villagers to intensify the activity. Villagers also become more reluctant to invite sambatan laborers because they are aware that once they invite villagers, they will accumulate psychological debt and they expect difficulties in maintaining reciprocity because their own opportunity cost will likely increase in the future.

Labor arrangements under the krubutan system, which is generally more rigid through fixed membership and hosting, are still widely practiced for various farming operation in upland hamlets. However, as the number of krubutan group members is small (3-5 people), this condition to some extent reduces transaction costs and facilitates a flexibility in the arrangement, such as in choosing the rotation day, type of work and postponement of working days. Participants have the advantage of arranging krubutan especially for activities that can be done flexibly, such as terrace construction and repairing and activities related to timber and firewood construction. krubutan is also important for activities that must be done in a strict time frame, such as land preparation.

Prayaan, which is principally rigid in terms of fixed membership, but flexible regarding hosts, is still widely practiced for various farming operation in upland hamlets. Even though membership is fixed, members have flexibility and advantages such as lower payment and priority in use of labor as compared to non-members. Households have the advantage of arranging prayaan labor especially for activities that need large numbers of workers, such as terrace field construction, land preparation, activities related to timber and firewood and delicate work activities such as weeding. By combining prioritization of group members' requirements and lower payment for members for labor usage, prayaan will likely evolve in the future.

Despite a transformation process has occurred in the labor exchange institutions in rural Java, community members with tight social relationship have the capacity to adapt to the process of change. In the broader sense, villagers in both upland and lowland hamlets have general basic principles regarding social relationship. Kinship relationships, often overlapping with neighboring relations, are still predominant among villagers. The basic structures of the relationships bring about fewer difficulties in the arrangement of collective work among villagers, at least for house construction and repairing. However, division of labor and the diversification of



villagers' income sources may enable well-off households to build modern houses. This possibility may reduce the need for collective work in the future as the process requires highly skilled construction labor.

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