Religious Festivities and Marketing of Small Ruminants in Central Java – Indonesia

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ABSTRACT

Indonesia is a country where small ruminants are important in religious festivities. This study analyzes small ruminant marketing opportunities on account of the Moslem feast of sacrifice, Idul Adha, in three agro-ecological zones in Central Java. Small ruminant marketing is classified into three categories, namely: 1) good — the market situation associated with the religious feast of Idul Adha; 2) risky —usually occurring in August and September when farmers need cash to prepare the paddy fields and to pay school fees; and 3) normal — which is how the market situation may be described in the other parts of the year.

A total of 150 farmers are visited monthly, over a period of one year, to observe their marketing strategies and the economic benefits gained from keeping small ruminants. Sheep fattening on the basis of rice bran supplementation is explored as a feasible innovation for the lowlands. Ten small ruminant markets are monitored two times corresponding to each of the three market situations. Added to this, 42 roadside sellers and 44 mosques are visited. The supply, demand, price, and weight of animals offered at the markets show a peak during Idul Adha. In the lowlands and middle zone, sheep are preferred over goats as sacrificial offerings during Idul Adha. In the uplands, goats dominate the farming system and the small ruminants' markets. The Idul Adha market requires male ruminants of one year of age with a bodyweight of above 25 kilograms. The majority of the farmers are not able to adjust the raising of their small ruminants in time for Idul Adha, because of their small flock sizes and the fact that they have to sell their animals to meet urgent cash needs, in particular at the end of the dry season and the start of the school year. Farmers possess minimal marketing information and usually complain about the prices they receive for their merchandise. The raising of these animals is only a secondary activity on these mixed farms. Value added estimates from small ruminants per hour of family labor input are 33–38 percent below the minimum wage labor rate. The proposed innovation to introduce sheep fattening in the lowlands for Idul Adha proves to be economically viable; however, the number of sheep that households can fatten is limited.

INTRODUCTION

Small ruminants play a key role in Moslem religious festivities (Subandriyo 1998; Jabbar 1998). Each Moslem family with a higher living standard is obliged to slaughter a sheep or a goat during the *Idul Adha*, or the feast of sacrifice. Cattle can be slaughtered by a group of seven persons. Idul Adha is celebrated on the tenth day of the month *Dhu'l Hijja*. Idul Adha, *which is held every* after 355 days, is the sacrifice performed by the pilgrims as part of the ceremonies of the great pilgrimage. While the pilgrims are making their sacrifices at Mina in Saudi Arabia, the ceremony is observed simultaneously by Moslems everywhere. The task of coordinating the distribution of meat among the poor in the society and the people who have sacrificed, is undertaken in the mosques. Relatively high prices of small ruminants marketed before the Islamic holidays have been observed in different regions, like Mauritania, Pakistan, Nigeria, and the Sahel (Thys and Wilson 1996; Rodriguez et al. 1995; Jabbar 1998; Turner and Williams 2002). In Ethiopia, livestock prices are also higher during religious festivals (Andargachew and Brokken 1993).

In Indonesia, about 90 percent of the people are Moslems. This could provide small ruminant farmers an opportunity to benefit from the important role these animals play in the social life of the people. The birth of a child is also celebrated with the slaughter of sheep or goats: two male sheep or goats for the birth of a son, and one of either these animals is slaughtered for the birth of a daughter.

The availability of markets is a key factor in livestock development (de Haan et al. 1996). In Indonesia, the small ruminant markets are organized every five days. In general, market prices for small ruminants are not very attractive to the farmers (Baliarti 2002).

The objective of this study is to analyze the impact of the Idul Adha celebrations on small ruminant marketing in Central Java, Indonesia. The hypothesis is that farmers can benefit from the opportunities presented by the Idul Adha celebrations, by timing the sale of their ruminants during the period of increased demand as occasioned by these festivities.

DATA SOURCES AND METHODS

Study Area

This study is done in three agro-ecological zones in Yogyakarta Province. This province is situated in the southern part of Central Java. There are two seasons throughout the year: the wet and the dry season. The wet season usually begins in September and lasts till about April. The monthly rainfall varies between 3 mm and 496 mm. Yogyakarta Province comprises five districts, three of which are chosen as study areas, namely, Bantul, Sleman, and Kulonprogo. The total number of sheep and goats in each of these districts is estimated at 800 in Bantul, 1,500 in Sleman, and 1,500 in Kulonprogo. These districts represent the lowlands, the middle zone, and the uplands, respectively.

Lowlands (< 100 m above sea level) are characterized by rice monoculture systems combined with cassava-growing. The predominant types of livestock are cattle and buffalo. Farmers use them for draught purposes; cattle are also used for fattening. Small ruminant production is characterized by extensive grazing along roadsides, and on other common lands and harvested crop fields. In the lowlands, farmers have easy access to rice bran. The middle zone is found at approximately 100–500 m above sea level. In this zone, multiple cropping systems are the main agricultural activity, combining paddy fields and annual crops, such as maize, groundnut, cassava, and vegetables. The populations of small and large ruminants in this zone are relatively the same. Uplands are situated over 500 m above sea level. Here, annual crop production systems are

practiced. The main crops are cassava, maize, groundnut, and vegetables. Some perennial crops like banana and coconut are also grown. Etawah grade goats (which are a cross between the local Kacang and Jamnapari varieties) are the main livestock type in the uplands because large numbers of leguminous trees are grown here. In Indonesia, farmers believe that goats thrive better on tree leaves, and sheep are considered to be better suited for grazing.

Marketing Periods

Small ruminant marketing is expected to differ over three distinct periods. The market situation during the religious feast Idul Adha is classified as 'good'. During this period the demand and prices are expected to be higher than in other periods of the year. Male animals to be sold for Idul Adha have to be one year of age and have to weigh at least 25 kg. The Idul Adha marketing period starts about three weeks before this feast. Idul Adha takes place about two months after *Idul Fitri*, the celebration of the end of the *Ramadan*. *Idul Fitri* is expected to have no impact on small ruminant marketing because during this festivity, beef and poultry are the preferred dishes.

The market situation is considered 'risky' in the period August-September. In that period farmers need cash for paying school fees and preparing paddy fields. The start of the school period (around August-September) usually coincides with the end of the dry season. The selling prices of small ruminants are expected to be relatively low during this period. In the other periods of the year, small ruminant marketing is considered normal since it is not affected by special circumstances.

Farmers' Survey

In each of the study areas, 50 farmers were selected for the monitoring of their small ruminant marketing practices. These farmers kept Etawah-grade goats or Javanese fat-tailed sheep. The changes in small ruminant flocks were recorded monthly for one year (July 2002 – June 2003). In addition, farmers were interviewed regarding their perception of the marketing of small ruminants, when they sold small ruminants, how small ruminants were sold, and at what prices.

Small ruminants' economic benefits were recorded over the same period. During the recording period, only pre-weaning animals died, no mature animals died.

The physical production of small ruminants is estimated as follows:

$$Y_k = FS_k - IS_k + S_k - P_k + OT_k - IT_k + C_k, \text{ where}$$

Y_k = net production of small ruminants (kg),
FS_k = body weight (kg) of the flock at the end of the observation period,
IS_k = body weight (kg) of the flock at start of the observation period,
S_k = body weight (kg) of small ruminants sold,
P_k = body weight (kg) of small ruminants purchased,
OT_k = body weight (kg) of small ruminants given as gift for social obligations,
IT_k = body weight (kg) of small ruminants received as gift, and
C_k = body weight (kg) of small ruminants slaughtered at the farm.

The economic value of the physical production, represented as Value Added (*VA*), is calculated as the value of the physical production minus the variable cash costs. Variable cash costs in this study are the expenses for the concentrate feed (rice bran). Medicine was not used. The *VA* is estimated as:

$$VA = (Y_k \text{ x price per kg}) - \text{feed costs.}$$

The prices of small ruminants per kg of bodyweight are based on the average prices

farmers receive from the sale of small ruminants divided by body weight.

The opportunity Value of Manure (*VM*) is calculated as the total Dry Matter (DM) of the manure produced (estimated as 0.5 kg DM/head) times the estimated price per kg DM of manure (100 Rp per kg DM; 1 € = Rp 12 000 in 2004):

$$VM = DM\ manure \times price\ per\ kg.$$

Potential Impact of Idul Adha on Sheep Fattening

In the lowlands, sheep fattening had been proposed by some farmers as a feasible innovation. In the lowlands, farmers have easy access to rice bran. Sheep fattening on the basis of rice bran supplementation could be particularly interesting when farmers could arrange the sale of fattened males in relation to the Idul Adha period.

Average daily gain could be improved from the present 0.06 to 0.15 kg d^{-1} per head by increasing the level of rice bran supplementation from the present level of 0.13 to 0.3 kg d^{-1}

(Basuno and Petheram 1982; Budisatria 1996). Farmers mentioned during interviews that the maximum number of sheep they could keep at one time was five. They lacked household labor and feed resources to manage more animals.

We explored the impact of Idul Adha marketing opportunities by developing two sheep-fattening scenarios. In scenario 1, farmers are proposed to fatten five male sheep two times a year, with an initial bodyweight of 10 kg and average daily gain of around 0.15 kg. Then, the sheep can be sold at 9 months of age with a final bodyweight of around 35 kg. In scenario 2, farmers are to fatten sheep in one round of 9 months up to the age of one year, with initial body weight of 10 kg and average daily gain of 0.1 kg. It is expected that in this scenario farmers could arrange their sheep fattening in time for Idul Adha. Mortality during the fattening period is assumed to be 10 percent, which is in line with the mortality rate of sheep kept by farmers in the lowlands. The input values used for the sheep fattening scenarios are shown in Table 1. Two selling price levels are used: for sheep-fattening scenario 1, the average price received by farmers over the normal and risky market

Table 1. Inputs values for proposed sheep fattening scenarios in the lowlands in Central Java, Indonesia.

Parameters	Scenario 1*	Scenario 2**
Start weight (kg)	10	10
End weight (kg)	37	37
Rice bran (kg d^{-1}head)	0.3	0.2
DM manure production (kg d^{-1} head)	0.5	0.5
Feedlot period (d head)	180	270
Mortality (%)	10	10
Price weaner sheep (Rp 10^3)	250	250
Selling price (Rp kg^{-1})	13,500	19,000
Price rice bran (Rp kg^{-1})	600	600
Manure price (Rp kg^{-1})	150	150
Time spent (h d^{-1})	3.2	3.2

*Scenario 1: two fattening rounds of animals from 3-9 months of age;
**Scenario 2: one fattening round of animals from 3-12 months of age;

€ 1 = Rp 12,000 in 2004

periods; for scenario 2, the prices received by farmers during the last few weeks before Idul Adha. The different price levels are based on interviews with the selected farmers. The labor accounted for in the scenario study is only adult labor, whereas the family labor used under the present production systems includes children.

Market Survey

A total of ten small ruminant markets (three markets in the Bantul district, four markets in Sleman, and three markets in Kulonprogo) were monitored. These markets represent all the small ruminant markets in these districts.

These markets selling small ruminants are planned according to the local calendar. A market is organized every five days and each market has a different opening day. Each market was visited two times in the normal situation (April–May 2002), the risky situation (August-September 2002), and in the three-week period prior to the Idul Adha celebration (February 2002). The data collected included the supply of small ruminants, number of small ruminants sold, prices, and body weights. The data were collected by interviews in the small ruminant market when the buyer (usually a trader and sometimes a small vendor or an individual consumer), and the seller (usually a village collector and sometimes a farmer) had reached an agreement.

Roadside Sellers' Survey

Interviews were also conducted with sellers at roadsides. Two weeks before the Idul Adha celebration, many people sell small ruminants at the roadside; these vendors are normally not engaged in the selling of these animals during other times of the year. Roadside sellers buy their merchandise from the farmers or from small ruminant markets about four weeks before the Idul Adha marketing period starts. A total of

42 sellers were interviewed: 24 in the middle zone, 9 in the lowlands, and 9 in the uplands. Survey methods and data collected were the same as in the market survey. However, body weights could not be measured because the sellers did not give their consent. The roadside sellers' survey started two weeks before the Idul Adha celebration.

Small Ruminants Slaughtered at Mosques during Idul Adha

During the Idul Adha, 44 mosques were surveyed: 15 in the lowlands, 20 in the middle zone, and 19 in the uplands. These mosques were located in the study areas and represented about 20 percent of all mosques in the three districts. The parameters investigated were the number of sheep, goats, and cattle slaughtered during Idul Adha. Mosques were visited before the animals were sacrificed and interviews were done with the head of the mosque. This was also done to minimize misinterpretation, as people usually used the term 'goat' for both sheep and goats.

Data Analysis

To evaluate the economic benefits of small ruminants, an ANOVA model is used with zone as factor and different economic benefits as dependent variables. To evaluate the small ruminant markets in the different zones and during the different market situations, an ANOVA model is used with zone and market situation as factors and number of animals offered, animals sold, price per animal, and body weight per animal as dependent variables. The results are presented per market location and per market situation. Differences between means are analyzed by Tukey's (HSD) test. The number of animals offered and sold by roadside sellers and the prices of these animals, and the number of animals being slaughtered at the

mosques during *Idul Adha* are analyzed using one-way ANOVA with zone as factor.

RESULTS

Farmers' Marketing of Small Ruminants

Table 2 gives farmers' information in relation to the marketing of small ruminants. On average, 46 percent of the farmers had sold small ruminants over a period of one year. Among these sellers of ruminants, 40 percent of farmers in the lowlands and 55 percent in the middle zone sold them during Idul Adha. In the uplands this figure was only 21 percent. Mostly male animals were sold. The main reason for selling was to finance urgent cash needs. In the lowlands and middle zone, the selling prices of small ruminants during Idul Adha were higher by 32 and 19 percent respectively, than in the normal market situation, and by 74 and 36 percent respectively, than in the risky market situation. In the uplands, the farmers did not give the exact price of small ruminants; most farmers in the uplands reasoned that they did not know the exact price. They were not so much aware of differences in prices between the Idul Adha period and other periods of the year. Most farmers (82%) sold their small ruminants to the village collectors. Overall, the farmers felt that the village collectors were reliable in assessing the prices, although they invariably complained about the prices they received. In general, there was only very little market information available to them.

Figure 1 presents the trends in the average number of small ruminants per farmer in the different agro-ecological zones for a period of one year. The trends show a drop in flock sizes during Idul Adha and in the risky period. This drop in the lowlands, middle zone, and uplands during Idul Adha was 0.5, 0.7 and 0.3 animals per farm, respectively, while during August-

September it was 0.3, 0.3 and 0.6 animals per farm, respectively.

Economics of keeping Small Ruminants

Table 3 gives the economic benefits of small ruminant flocks in three agro-ecological zones in Central Java. The value added (*VA*) from small ruminants per household per year is significantly higher in the uplands than in the other two zones, due to the higher net production and to better prices for goat breeding stock in this zone. The *VA* from small ruminants per hour of household labor input is 33–38 percent below the minimum wage labor rate.

Table 4 shows the impact of the two sheep-fattening scenarios — one intended for the normal market, and another for the Idul Adha market — on the *VA* estimates per household in the lowlands. Cash inputs include the purchase of weaned sheep and rice bran. Farmers also feed the sheep cassava peels and field grass. The collection of these feeds is included in the family labor hours spent. The benefits of keeping sheep are the cash income from selling sheep under the normal market conditions and for the Idul Adha market, and the animal manure collected. There are no differences in *VA* between the two scenarios. The results show that the *VA* from fattening small ruminants per hour of household labor input is comparable to the minimum wage labor rate in scenario 1, whereas in scenario 2 the returns per family labor input are 34 percent higher than the minimum wage labor rate.

Market Information

Table 5 gives the number of sheep offered and sold, the prices, and the weights of sheep in three market situations for three agro-ecological zones in Central Java. Table 6 gives the same information for goats. There is a large variation in the number of sheep and goats offered for sale

Table 2. Farmers' information on marketing of small ruminants in three agro-ecological zones in Central Java, Indonesia.

	Agro-ecological zones		
	Lowlands	**Middle zone**	**Uplands**
Number of farmers	50	50	50
Average flock size, excluding kids *(n)*	3.4	3.9	4.0
Lambs/kids weaned per ewe/doe *(n y^1)*	1.8	2.2	2.3
Sales per farmer per year *(n)*	1.9	1.9	2.1
Farmers who sold small ruminants *(n)*	25	20	24
Sold in *Idul Adha (%)*	40	55	21
Sold in normal situation *(%)*	28	25	33
Sold in risky situation *(%)*	32	20	46
Type of small ruminants sold *(%)*			
Ram	77	29	44
Ewe	15	15	16
Doe	8	17	4
Lamb/Kid	0	39	36
Reason for sale *(%)*			
Urgent cash needs	48	39	58
Good price, *Idul Adha*	29	46	38
Culling (sick, old animals)	24	16	4
Farmers sale price of small ruminants *(Rp* 10^3)*			
Idul Adha	490	475	NK
Normal situation	371	400	NK
Risky situation	282	350	NK
Small ruminants sold to *(%)*			
Village collectors (*Blantik*)	80	75	92
Small ruminants markets	13	0	0
Slaughter houses	7	25	8
Reason why animals sold via village collectors *(%)*			
Easy and fast	67	15	71
Reduced transport cost	11	46	12
High price	5	4	17
Long distance to markets	17	35	0
Price difference market and village collector *(%)*			
Yes	61	50	21
No	31	43	79
Did not know	8	7	0
Reliability of village collector in assessing price *(%)*			
Yes	67	81	50
No	8	15	0
Did not know	25	4	50

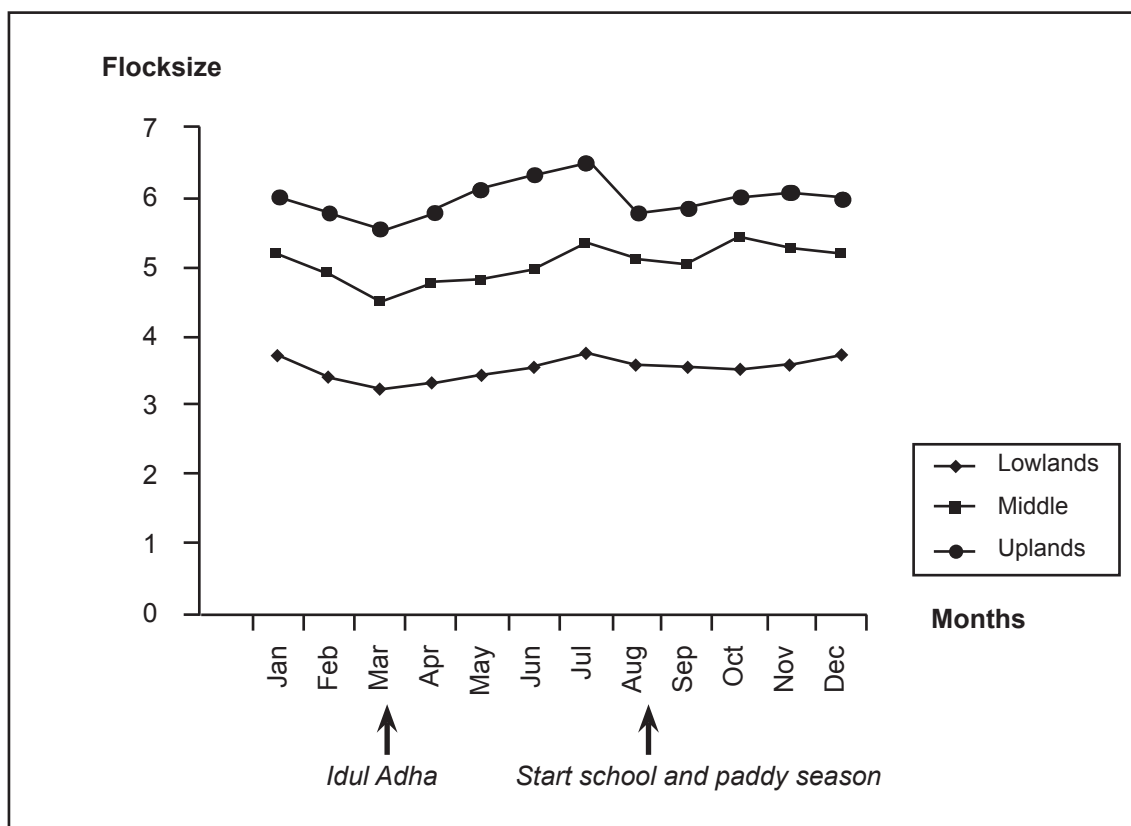NK=not known;
*€ 1 = Rp 12 000 in 2004

Figure 1. Changes over the year in flock size per farmer in three agro-ecological zones in Central Java, Indonesia.

Table 3. Economic benefits of small ruminant flocks in three agro-ecological zones in Central Java, Indonesia.

	Agro-ecological zones		
	Lowlands	**Middle zone**	**Uplands**
Number of farmers	50	50	50
Flock size *(n)*	3.4	3.9	4.0
Net production *(kg y⁻¹)*	$88.5^a \pm 4.0$	$93.5^a \pm 3.6$	$110.5^b \pm 3.5$
Manure *(kg y⁻¹)*	588 ± 31	710 ± 40	701 ± 36
Value Added *(Rp* 10^4 y⁻¹)*	$129^a \pm 3.1$	$126^a \pm 4.4$	$155^b \pm 6.5$
Time spent *(h d⁻¹)*	3.5 ± 0.2	3.7 ± 0.1	4.2 ± 0.2
VA per h** *(Rp)*	1007 ± 25	933 ± 33	1004 ± 42

*€ 1 = Rp 12 000 in 2004;
** minimum labour wage: Rp 1500 h⁻¹

[a, b]: different subscripts denote significant differences between means (P<0.05)

Table 4. Impact of sheep fattening scenarios on economic benefits per household for the lowlands of Central Java, Indonesia.

Parameters	Scenarios*	
	1	2
Total sheep fattened per year (*n*)	10	5
Net liveweight production *(kg)*	333	165.5
Manure *(kg)*	821.5	607
Value liveweight production *(Rp**10⁴ y⁻¹)*	450	316
Value manure *(Rp 10⁴ y⁻¹)*	12	9
Value Added *(Rp 10⁴ y⁻¹)*	180	176
Time spent *(h d⁻¹)*	3.2	3.2****
VA per h*** *(Rp)*	1537	2009

*Scenario 1: two fattening rounds of animals from 3-9 months of age
Scenario 2: one round of animals from 3-12 months of age;
**€ 1 = Rp 12 000 in 2004;
*** minimum labour wage: Rp 1500 h⁻¹
**** for 9 months of the year

Table 5. Number of sheep offered and sold, prices and weights for sheep in three market situations and three agro-ecological zones in Central Java, Indonesia.

	Market Situation	Market location			P**
		Lowlands	Middle zone	Uplands	
Number of markets (*n*)		3	4	3	
		Mean S.E.	Mean S.E.	Mean S.E.	
Sheep offered (*n*)	*Idul Adha*	228.7ᵃ ± 88.9	206.5ᵃ ± 22.6	47.0ᵃ ± 7.0	0.07
	Normal	110.3ᵃ ± 45.7	89.5ᵇ ± 10.0	13.3ᵃ ± 2.4	0.07
	Risky	64.0ᵃ ± 23.0	99.5ᵇ ± 14.4	29.0ᵃ ± 11.7	0.05
Sheep sold (*n*)	*Idul Adha*	43.0ᵃ ± 18.5	70.0ᵃ ± 11.2	11.7ᵃ ± 6.9	0.04
	Normal	29.3ᵃ ± 10.6	12.5ᵇ ± 1.7	3.7ᵃ ± 2.0	0.04
	Risky	20.7ᵃ ± 6.6	27.8ᵇ ± 11.2	7.0ᵃ ± 3.6	0.30
Price *(Rp* 10³)*	*Idul Adha*	722.0ᵃ ± 37.5	545.0ᵃ ± 24.8	528.0ᵃ ± 39.6	0.01
	Normal	350.0ᵇ ± 28.9	385.0ᵇ ± 11.9	325.0ᵇ ± 8.3	0.16
	Risky	424.5ᵇ ± 37.2	309.2ᶜ ± 16.9	219.7ᵇ ± 24.2	0.00
Body weight of sheep sold *(kg)*	*Idul Adha*	41.0ᵃ ± 0.9	31.5ᵃ ± 4.3	29.7ᵃ ± 1.0	0.08
	Normal	25.0ᵇ ± 2.3	25.2ᵃ ± 2.8	25.0ᵇ ± 0.3	0.97
	Risky	28.7ᵇ ± 3.8	20.2ᵃ ± 1.1	19.4ᶜ ± 0.9	0.04

ᵃ,ᵇ Different superscripts denote significant differences between means within columns (P<0.05) in each parameter
*€ 1 = Rp 12 000 in 2004
**P = significance between zones

Table 6. Number of goats offered and sold, prices and weights for goats in three market situations and three agro-ecological zones in Central Java, Indonesia.

	Market Situation	Market location			P**
		Lowlands	Middle zone	Uplands	
Number of markets *(n)*		3	4	3	
		Mean S.E.	Mean S.E.	Mean S.E.	
Goats offered *(n)*	*Idul Adha*	130.0[a] ± 120.0	26.8[a] ± 12.7	233.0[a] ± 37.7	0.14
	Normal	23.0[a] ± 13.5	18.0[a] ± 8.8	120.3[a,b] ± 31.8	0.002
	Risky	56.0[a] ± 34.5	22.3[a] ± 12.3	70.7[b] ± 17.7	0.31
Goats sold *(n)*	*Idul Adha*	27.7[a] ± 24.2	10.3[a] ± 5.6	69.0[a] ± 40.5	0.28
	Normal	12.0[a] ± 7.0	2.0[a] ± 1.2	19.0[a] ± 11.7	0.27
	Risky	26.0[a] ± 22.0	8.3[a] ± 4.3	18.7[a] ± 5.2	0.58
Price *(Rp* 10³)*	*Idul Adha*	572.0[a] ± 35.8	488.0[a] ± 40.7	478.0[a] ± 21.5	0.22
	Normal	333.0[b] ± 33.3	350.0[b] ± 23.7	350.0[b] ± 28.9	0.68
	Risky	414.3[b] ± 11.8	263.7[b] ± 36.3	303.5[b] ± 11.3	0.02
Body weight of goats sold *(kg)*	*Idul Adha*	33.0[a] ± 1.2	31.5[a] ± 4.5	28.4[a] ± 1.3	0.48
	Normal	24.0[b] ± 1.2	25.2[a] ± 2.4	26.0[a] ± 0.6	0.24
	Risky	26.3[b] ± 1.5	17.8[a] ± 3.3	22.6[a] ± 2.1	0.13

[a,b]Different superscripts denote significant differences between means within columns (P<0.05)   in each parameter

*€ 1 = Rp 12 000 in 2004

**P = significance between zones

and in the number sold. The market situation has a significant effect (P<0.05) on the number of sheep offered for sale and sold in the middle zone, and on the number of goats offered for sale in the uplands. In the normal market situation the number of goats offered for sale is significantly higher (P<0.01) in the uplands than in the other zones. Overall, the number of sheep offered for sale and the number sold are much lower in the uplands than in the other zones, whereas the number of goats offered for sale and numbers sold are much higher in the uplands than in the other zones.

The market situation has a significant effect on the prices and body weights of sheep and goats sold for most market locations. Compared to the normal and risky market situations, the prices of sheep being sold during Idul Adha increase, on average, by 1.7 and 1.9 times, respectively. Compared to the normal and risky market situations, prices of goats being sold during Idul Adha increase, on average, by 1.5

and 1.6 times respectively. In the lowlands, the prices of sheep and goats in the risky situation tend to be higher than in the normal situation, which is the opposite of the situation in the middle zone and the uplands. The highest prices for sheep during Idul Adha are found in the lowlands (P<0.01). The price of goats during Idul Adha also tends to be higher in the lowlands than in the middle zone and uplands. Market location has a significant effect on the price of sheep during the risky market situation (P<0.001,) with the highest price recorded in the lowlands.

Small ruminants sold a few days before the Idul Adha celebration are all male, more than one year old, and have a body weight of 25 kg or more. The increase in price during Idul Adha is related to the increase in body weight and the increase in price per kg of body weight. On basis of the data in Table 5, it can be estimated that the prices of sheep per kg body weight during Idul Adha are 17.6, 17.3, and 17.8 thousand rupiahs

for the lowlands, middle zone, and uplands, respectively; during the normal market period they are 14.0, 15.3, and 13.0 thousand rupiahs, respectively, and during the risky market period they are 14.8, 15.3, and 16.2 thousand rupiahs, respectively. The body weight of goats being sold varies widely between zones and the market periods. On the basis of the data in Table 6, it can be estimated that the price of goats per kg body weight is much higher during Idul Adha than in the other market periods. During the Idul Adha market period, the prices of goats per kg body weight for the lowlands, middle zone, and uplands are 17.3, 15.5, and 16.8 thousand rupiahs, respectively; during the normal market period the corresponding prices are 13.9, 13.9, and 13.5 thousand rupiahs, respectively, and during the risky market period they are 15.8, 14.8, and 13.4 thousand rupiahs, respectively.

Table 7 presents an overview of the marketing of sheep and goats by roadside sellers. Most sellers in the lowlands and the middle zone offer sheep rather than goats, while sellers in the uplands mainly supply goats. In the lowlands and middle zone, only few goats are being sold. This is comparable with the trends in the small ruminant markets. The percentage

of small ruminants being sold on any one day by roadside sellers is higher than what we found in the markets: by 48 percent for sheep and 56 percent for goats. The average prices per head tend to be higher in the lowlands than in the other zones and tend to be higher for sheep than for goats.

Marketing Structure for Small Ruminants

Figure 2 gives the marketing structure for small ruminants in Central Java. The information from the farmers and the market survey shows that the main actors are the farmers, village collectors, and long-distance traders. All payments are in cash. During Idul Adha, roadside sellers and mosques are also involved in this marketing system. The small vendors of roasted meat and other small dishes play a part, as well. In the cities, for instance, retail butchers sell mutton to restaurants. Farmers rarely sell their animals directly in the small ruminant market due to the transport costs, the time constraint, and the fact that they are not in a strong bargaining position to negotiate with the traders. Farmers most commonly sell their small ruminants through the local village

Table 7. Average number and prices of sheep and goats marketed through roadside sellers during the Islamic month of *Idul Adha* in three agro-ecological zones in Central Java, Indonesia.

		Market location		
		Lowlands	**Middle zone**	**Uplands**
Number of sellers *(n)*		9	24	9
		Mean S.E.	Mean S.E.	Mean S.E.
Animals offered *(n)*	Sheep	31[ab] ± 7.0	43[a] ± 5.6	7[b] ± 1.4
	Goats	4[a] ± 1.0	3[a] ± 0.9	32[b] ± 6.7
Animals sold *(n)*	Sheep	21[a] ± 6.7	16[a] ± 1.9	2[b] ± 0.6
	Goats	2[a] ± 0.8	1[a] ± 0.3	19[b] ± 8.5
Price *(Rp* x 10³)*	Sheep	700.0[a] ± 13.0	606.3[a] ± 9.2	583.0[a] ± 24.7
	Goats	544.0[a] ± 16.0	506.0[a] ± 12.6	458.0[a] ± 87.4

[a,b]Different superscripts denote significant differences between rows (P<0.01)
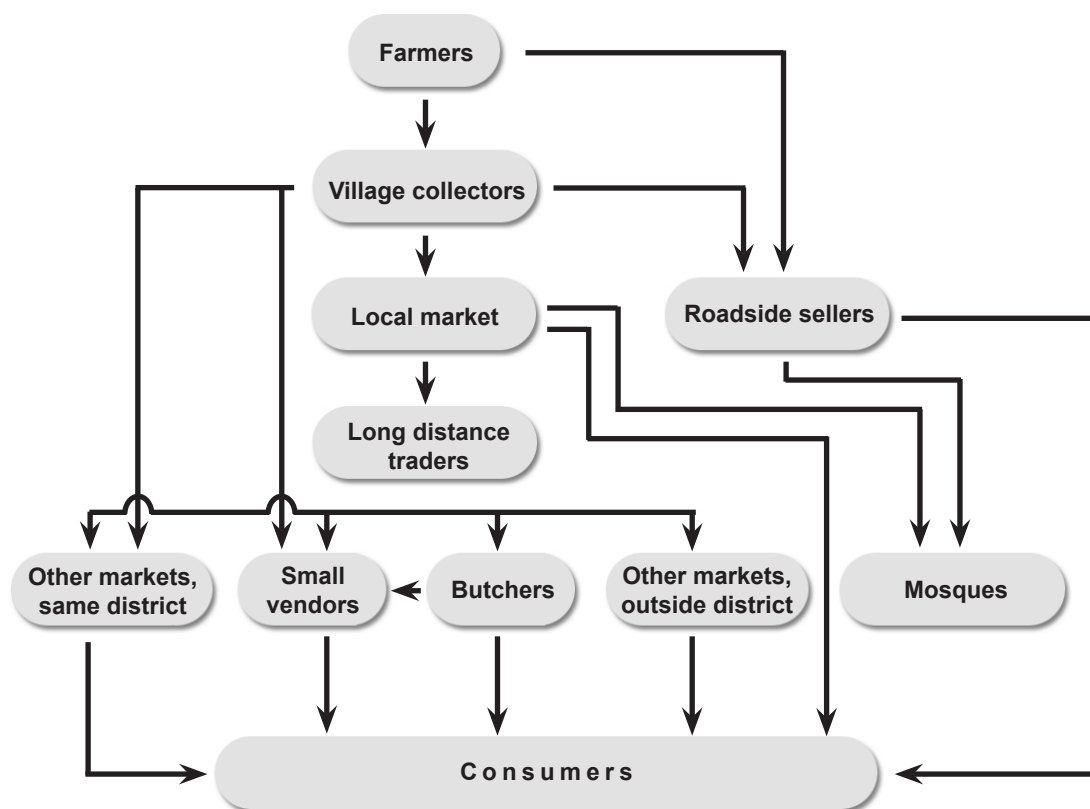*€ 1 = Rp 12 000 in 2004

Figure 2. Small ruminants marketing systems in Yogyakarta-Central Java

collector (Table 2), to whom they generally have easy access, even in isolated areas. Farmers are familiar with this person who usually lives in the same village and sometimes is a member of a farmers' group in the village.

The village collector takes the animals to the small ruminant market. Often, the village collector is assisted by 1–2 persons in the buying or selling of small ruminants. Figure 3 aggregates the number of small ruminants offered and sold per market day in the different market situations and in the different agro-ecological zones. It illustrates the increase in market volume and in the number of animals sold during Idul Adha. The differences in market volume and in animals sold between the normal and risky market situation are relatively

small. The percentages of sheep and goats being sold compared to the supply are low in all zones and market situations: during the *Idul Adha,* normal, and risky market period, they are on average 26, 21, and 29 percent for sheep, and 27, 20, and 36 percent for goats, respectively. On average, village collectors have to take an animal 2–3 times to a market before it is finally sold. They incorporate this in the prices offered to the farmers. If the animals are not sold, village collectors buy feed for the animals they have to take home. During the market survey, we met the same village collectors in different market places. Prices are usually based on a visual appraisal of the animal and an estimate of the body weight. There is no evidence that prices drop in the course of a market day.
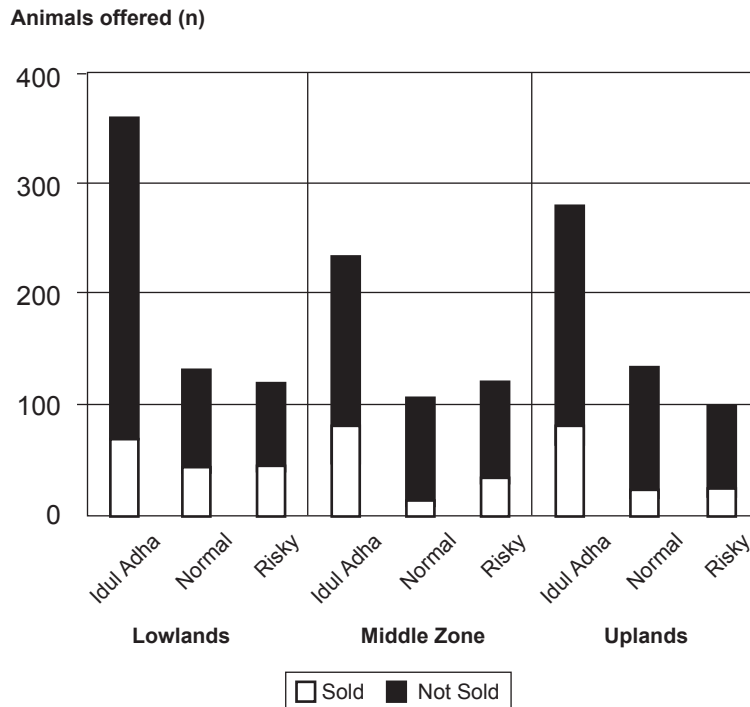
Animals offered (n)

Figure 3. Average number of small ruminants offered and sold per market day in the
***Idul Adha*, normal and risky market situation in three agro-ecological zones in**
Central Java, Indonesia

Long-distance traders operate between small ruminant markets in different regions. They buy animals from the village collectors and sell them again in different markets. Traders can even stock animals over a longer period, while waiting for better market prices. The traders have small trucks in which they transport the animals; some traders transport the animals to the capital city Jakarta. The buyers from these traders can be small vendors, retail butchers, or consumers. Consumers are often individuals who wish to celebrate the birth of a child.

Roadside sellers buy small ruminants from farmers or small ruminant markets about four weeks before the Idul Adha celebration. At this time the prices have not increased yet. They keep small ruminants in their backyard and send them to graze on roadsides and football fields. Two weeks before Idul Adha, they start to offer these animals at strategic positions along the roadside where buyers have easy access. The buyers of small ruminants from the roadside sellers are those individuals who intend to sacrifice the animal bought for Idul Adha. The percentage of small ruminants being sold is much higher on the roadsides than on the markets. The roadside prices are similar to the prices in the markets.

The average number of animals slaughtered per mosque during the day of Idul Adha is given in Table 8. There is a significant difference (P<0.01) in the number of sheep being slaughtered between the different zones, while the number of goats and cattle does not differ significantly between the zones. In the

Table 8. Average number of sheep, goats and cattle slaughtered during *Idul Adha* per mosque in three agro-ecological zones in Central Java, Indonesia.

	Mosque location		
	Lowlands	**Middle zone**	**Uplands**
Number of mosques *(n)*	15	20	19
	Mean S.E.	Mean S.E.	Mean S.E.
Sheep *(n)*	$6.4^a \pm 0.97$	$9.3^a \pm 1.64$	$0.3^b \pm 0.73$
Goats *(n)*	$3.8^a \pm 0.62$	$2.4^a \pm 0.61$	$2.8^a \pm 1.71$
Cattle *(n)*	$2.4^a \pm 0.26$	$2.8^a \pm 0.31$	$1.9^a \pm 1.78$

[a, b] Different superscripts denote significant differences between means within rows (P<0.01)

lowlands and the middle zone, sheep are the predominant type of animal being slaughtered during Idul Adha; in contrast, hardly any sheep are slaughtered in the uplands.

DISCUSSION

In Indonesia, the marketing system for small ruminants follows a complex model involving many stakeholders. This indicates that such a system is not very efficient. Another cause contributing to the inefficient marketing of these animals is that their supply in the markets is always much larger than the demand; on average less than one third of the animals offered on a single market day are sold. Farmers complain that there is no marketing information available to them. This could be the reason why farmers feel that they receive unfair prices for their merchandise. However, only few farmers doubt the reliability of village collectors in assessing the price (Table 2). Overall, there is not much difference between the prices received by the farmers and the market prices of the small ruminants during the normal and risky market situations; however, during Idul Adha the prices in the markets and in the roadside stalls are about one-quarter higher than the prices received by the farmers. In Indonesia, the marketing model could be shortened by strengthening farmers groups who could organize the slaughtering

of livestock themselves and sell the products directly to small vendors and retail butchers, and not via village collectors to long-distance traders. However, the formation of a marketing group can be time-consuming. It should be realized that the raising of small ruminants is only a secondary activity on a smallholder mixed farm. At present, only about 5 percent of all farmers sell their animals directly in the markets (Table 2).

Since the 1980s, the road infrastructure has improved considerably and the long-distance traders have helped to integrate the local markets into a national market system. Already, the marketing structure of small ruminants in our study is simpler than in a previous study by Knipscheer et al. (1987). There are no intermediate traders (*Blantik cilik* and *Blantik gede*) found in our study.

Idul Adha has a significant effect on the small ruminants markets. All parameters investigated in the small ruminant markets ─ namely, supply, demand, price, and body weight ─ tend to increase drastically during the Idul Adha period. The number of small ruminants being sold on one market day increases during Idul Adha by 3.0 and 1.4 times and the prices increase by 1.6 and 1.8 times, compared to the normal and risky market period, respectively. The differences between the normal and the risky market periods are relatively small. The

increase in prices during Idul Adha is based on the higher body weight of animals offered and a higher price per kg during Idul Adha. The higher body weight is the result of the requirement that small ruminants offered during the *Idul Adha* celebration have to be male animals of more than one year of age with a minimum body weight of 25 kg. The prices per kg body weight for sheep and goats are comparable. On the basis of Tables 5 and 6 it can be estimated that, on average, the price per kg body weight during *Idul Adha* is 17.2 thousand rupiahs, while during the normal and risky market situation this is 14.0 and 14.8 thousand rupiahs, respectively. The major reason for this increase in prices during Idul Adha is that each Moslem family with a higher living standard would like to sacrifice a sheep (or a goat). The number of people with a higher living standard has considerably increased over the past two decades.

In the lowlands and middle zone, sheep are the predominant type of animal offered and being sold on the markets and at the roadsides, and slaughtered in mosques. The upland markets are dominated by goats. According to Panin and Mahabile (1997), Moslems' preference for sheep meat is a crucial factor for rearing sheep. Reasons for the preference of sheep could be related to a preference for fat meat (Thys and Wilson 1996). Apart from the consumers' preferences, the supply of small ruminants during the month of Idul Adha is affected by the different farming practices in the different zones. In the lowlands, sheep dominate supply and demand, although slightly more goats than sheep are kept. This could be related to the large supply of sheep from outside the region in the Idul Adha period, due to the relatively good road infrastructure in this zone. In the middle zone, slightly more sheep are kept than goats, while in the uplands considerably more goats are kept than sheep. Upland farmers say that they are not aware of differences in prices between small ruminants during the Idul Adha, normal,

or risky market periods. The large increase in sheep sold during Idul Adha and the high number of sheep slaughtered in the mosques in the middle zone are closely linked to the relatively high standard of living in this zone. In 2000, the gross regional domestic product (GRDP) per capita in the Sleman district (middle zone) was 225 times higher than the GRDP per capita in the Bantul (lowlands) and Kulonprogo (uplands) districts (*Badan Pusat Statistik* 2000). The Sleman region is close to the provincial capital Yogyakarta, and is home to many educational institutes.

The number of cattle slaughtered per mosque during *Idul Adha* does not differ between zones; on average, it is 2.4. The Idul Adha rules stipulate that cattle must be sacrificed by seven people. So, people who would like to sacrifice cattle have to find six neighbors to join them. This is another reason why people prefer sheep and secondly, goats, for slaughtering during Idul Adha.

For the farmers, it is difficult to arrange the sale of their small ruminants in time with the period when the prices increase. In a smallholder setting, the planning of selling animals is difficult anyway, in particular when the attractive market situation requires adult males of at least 25 kg, as the Idul Adha market does. Only 25 of the 150 farmers had sold an animal during the Idul Adha period. Farmers mainly sell animals when they have urgent cash needs. These needs are greater and the selling prices are lower in the risky market period than in the normal market period (Table 2). These events usually come together at the end of the dry season, in August-September. In the middle zone and the uplands, the risky market situation for the farmers is reflected in the lower body weight of small ruminants marketed compared to the normal situation. Consequently, the market price of small ruminants in these zones tends to decrease in the risky situation. The price per kg body weight is not different between the normal

and risky market period. In the lowland markets, the risky market situation for the farmers is not reflected in lower body weights and prices at the markets in the risky situation. These markets are more easily accessible to traders and buyers from outside the region than the markets in the middle zone and the uplands. In Pakistan, Rodriguez et al. (1995) also found that farmers felt that they were not in a position to bargain efficiently, because of the frequent need of selling small ruminants for urgent cash requirements.

The circumstances surrounding the marketing of small ruminants are reflected in the rise and decline of the number of animals owned by the farmers, as shown in Figure 1. The average number of small ruminants kept drops in March, particularly in the lowlands and middle zone, in which month the Idul Adha festivities takes place in the study period. After the month of Idul Adha, the number of small ruminants increases again. In August, the number of small ruminants decreases, which coincides with the farmers' urgent cash needs due to paddy field preparation, paying school fees for their children, and sometimes lack of staple food, and crop failures. Thereafter, the flock sizes stabilize again.

The consumers are in a weak position, too. Recently, many people preferred to send money to their mosque instead of buying an animal themselves. A committee from the mosque buys small ruminants collectively from roadside sellers or from small ruminant markets.

The contribution to household income of the sales from small ruminants is small: 105-129 € y^{-1}. And the returns per hour of family labor input are well below the minimum labor wage. A main reason is the high labor demand for feed collection and cleaning the sheds. The innovation scenarios indicate that if lowland farmers can start specializing in sheep fattening, on the basis of rice bran supplementation, the returns per unit of family labor would be comparable to the minimum labor wage. The results on sheep-fattening scenario 2 (Table 4) show that raising sheep in time for the Idul Adha demand is theoretically possible. If households would start fattening sheep for the Idul Adha period, the returns per unit of family labor input could become one-third higher than the minimum labor wage. But, the number of sheep households can fatten is limited due to the lack of household labor and feed sources. So, the hypothesis that farmers can benefit from the opportunities presented by the *Idul Adha* celebrations by matching small ruminant production to the increasing demand, can be rejected. Only few farmers will have males of the correct type available in the Idul Adha period. It is unlikely that, in the future, small ruminants will become a main income-earner for rural households. Despite the benefits received from raising these animals, it remains a secondary activity.

CONCLUSIONS

It can be concluded that most farmers could not make proper use of the Idul Adha market opportunity. The majority of the farmers had no males of one year of age and a bodyweight of 25 kg available, due to their small flock sizes and the sale of their stock because of urgent cash needs, in particular at the end of the dry season and start of the school year. The village collectors had served as the link between the farmers and the small ruminant markets. Farmers had only little marketing information and complained about the prices they received for their small ruminants. Value added estimates from small ruminants per hour of family labor input were 33–38 percent below the minimum wage labor rate. Fattening sheep for Idul Adha was explored for the lowlands. It proved to be economically viable; however, the number of sheep that households could fatten was limited. It should be realized that, in Indonesia, the raising of small ruminants is only a secondary activity on smallholder mixed farms; this limits the possibilities of bridging the opportunities that the Idul Adha market brings.

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