

# Consumption Behavior and Poverty in the Rural Philippines: A quantitative description\*

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## 1. Introduction

The aim of this paper is threefold: to describe the consumption patterns of rural households in four sample villages with different rice ecosystems in the Philippines, to assess the living standards of those households, and to discuss some policy implications from such descriptions.

Consumption expenditure data are among the most basic and frequently used database essential for policy analyses. Standard methodologies of (consumer) demand analysis and poverty assessment tools are applied to the household consumption expenditure survey collected in the rural Philippines in 2003 by the International Rice Research Institute (IRRI). The main purpose of the survey was to assess the living standard and poverty situations of the four sample villages representing different rice ecosystems. While the paper does not intend to conduct a rigorous causal analysis of household behavior, it will discuss some policy implications arising from the descriptive analysis.

The paper is organized as follows. The next section provides a brief background of the household survey conducted by IRRI and a description of the four sample villages covered by the data. Section 3 describes consumption demand behavior of the rural households with a focus on differential consumption patterns between the poorer households and their better-off counterparts. Section 4 assesses the living standards and poverty situations of rural households in the four sample villages, followed by Section 5 reporting the results of simple regression analyses identifying some correlates of per-capita consumption expenditures. The final section summarizes our findings with some policy implications.

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## 2. The IRRI Data and the Four Sample Villages: A brief background

The International Rice Research Institute (IRRI) is one of the pioneers (along with other similar agricultural research centers such as ICRISAT, the International Crop Research Institute for Semi-Arid Tropics) in conducting farm household surveys, which cover both the production and consumption behavior of rural households, starting in the 1970s. In the rural Philippines, a long-term village study was initiated by IRRI in the mid-1970s in a village in Laguna province (Hayami, et al. 1978; Hayami and Kikuchi 1982, 2000). In the mid-1980s, another set of longitudinal village studies started in several villages in Luzon and Panay islands (David and Otsuka 1994). One of the major strengths of the household surveys conducted by IRRI, compared to similar but larger scale household surveys conducted by national statistical agencies or international organizations (such as the World Bank), is the long-term relationships that have been established and carefully maintained over the years through repeated visits and regular contacts between the village residents and the researchers. Such relationships are likely to improve the quality of the data collected and also contribute to the low refusal rate, which in the case of the 2003 round of the data collection was zero. Another important advantage arising from the established long-term relationship with the village residents (which is not exploited by this paper) is the long-term household panel data that can be constructed from the dataset.

The Technology, Income Distribution and Poverty (TIDP) study, the direct precursor to the household survey data used in this paper, started in 1993 in the islands of Luzon and Panay. At the outset of the 1993 TIDP study, four sample villages were purposefully selected to represent different ecological conditions that are likely to have differential effects on rice farming. Two villages were selected in Luzon island and two in Panay island. The two villages in Luzon can be characterized as (currently) non-irrigated but favorable in terms of rice ecosystem. One of the Luzon villages (village 1) is located in Laguna province (to the south of Metro Manila) and is served, in theory, by a government-constructed irrigation system constructed in the 1950s, but the portion of the irrigation system running in village 1 has not been functioning since the 1980s due to poor maintenance. The relative proximity to the Metro Manila area, however, is the key characteristic that distinguishes this village from all other sample villages (see Hayami and Kikuchi 2000 for more detailed discussion of the history of village 1). The other Luzon village (village 2) is located toward the northern end of the Central Luzon plain in the province of Nueva Ecija.<sup>1</sup> In contrast with village 1, village 2 has no access to government-constructed irrigation system. In both villages 1 and 2, farmers have made extensive use of water pumps to irrigate their rice fields since the 1990s.

The other two villages are both located in the province of Iloilo located in Panay island, but in contrasting environment.<sup>2</sup> One (village 3) is located in an upland area and a substantial portion of the village includes hilly and mountainous landscape. The last village (village 4), in contrast, is completely flat and serviced by a well-functioning irrigation system. Another major characteristic of village 4 is its relatively large share of household members working abroad. While the percentage shares of population

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<sup>1</sup> Village 2 was also covered by David and Otsuka (1994).

<sup>2</sup> The two villages in Iloilo are the same as the two of the three Iloilo villages studied by David and Otsuka (1994).

working abroad from the sample villages are 4 to 5% in villages 1 through 3, the share is 11% in village 4. Particularly notable is the high proportion of seafarers from the village. They are mostly collage graduates from maritime schools located in the provincial capital of Iloilo City. Major village-level characteristics are summarized in Table 1.<sup>3</sup>

The TIDP survey was conducted in 1993, 1996 and 2001 (see Hossain, Gascon and Marciano 2000). The 2003 consumption expenditure survey was conducted as a follow-up study of the earlier rounds of the TIDP survey and covered the same set of sample villages, and all the households living in the villages were interviewed (i.e., total enumeration). The total number of households covered by our 2003 survey was 1,218 (361 in village 1, 365 in village 2, 205 in village 3 and 287 in village 4). The 2003 survey instrument included the following components: (1) Household roster (including information on the children of the household head not living in the same household and others sending remittances to the household); (2) household asset holding (land, non-land assets including house and household appliances); (3) Exogenous shocks to the household during the past 10 years; (4) Household consumption expenditures; (5) 7 day diary of daily consumption expenditures and income.

### 3. Consumption Demand Behavior in the Rural Philippines

#### 3.1 Household Budget Shares

This section describes the consumption patterns observed in the four villages. Table 2 summarizes average budget shares of the households across all the sample villages and with breakdown by consumption quintiles (sorted by percapita household consumption expenditures). On average, 60% of the total budget is spent on food while 40% goes to non-food items. Among the food items, the largest single item, not surprisingly, is rice consumption, accounting for 16% of the total household budget. Roughly 9% is spent on the consumption of meat, 7% for vegetables and fruits, 7% for fish and 4% for dairy products and eggs. Among the non-food items, roughly 8% of the total household budget is spent for fuel and utility (e.g., electricity bill), 7% goes to education, 6% for personal care items (shampoo, soap and other daily necessities), roughly 3% each for clothing and transport, and 2% each for medical expenses, house improvement, and personal ceremonies (wedding, funeral, birthday, baptism, etc.). (Table 2, 1st column)

More notable, however, are the variations in the household budget allocation patterns across per capita-consumption quintiles. Table 2 also shows patterns of household budget shares disaggregated by consumption quintiles. As we can see in the 2nd to the 6th columns of Table 2, the share of food budget declines considerably from 69% among the households belonging to the lowest quintile to 43% among those belonging to the highest quintile. The rice budget share similarly declines from 26% to 7%.

Table 3 summarizes the ratio of the consumption budget share among the households in the highest quintile to the budget share among those in the lowest quintile for each consumption item; in the table, a consumption item for which this ratio is smaller

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<sup>3</sup> Further background information on the sample villages can be found in: David and Otsuka (1994), Hossain, Gascon and Marciano (2000), Hayami and Kikuchi (1982), and Hayami and Kikuchi (2000).

Table 1. Summary of Village Characteristics

Province Region Island	Village 1 Laguna IV-A (Central) Luzon	Village 2 Nueva Ecija III (Central) Luzon	Village 3 Iloilo VI Panay	Village 4 Iloilo VI Panay
Ecosystem type	'Irrigated'	'Favorable rain-fed'	'Upland'	'Irrigated'
Distance from <i>poblacion</i> (town proper)	3 km	4 km	2 km	3 km
Distance from city	105 km	147 km	588 km	589 km
Road condition 1986	dirt	1	1	2
Road condition 1999	concrete	5	5/1	7
River crossing going to <i>poblacion</i> ?	No	Yes	Yes	No
Bridge 1986	NA	Yes	No	NA
Bridge 1999	NA	Yes	Yes	NA
Elementary school	Yes	Yes	Yes	Yes
Total agricultural land (2003)	60 ha	177 ha	117 ha	129 ha
Paddy yield (2003) kg/ha	3,098	2,957	2,488	3,376
Agricultural land per capita (2003)	0.03 ha	0.11 ha	0.11 ha	0.10 ha
Population (1970)	474	722	611	744
Population (1980)	707	791	651	861
Population (1986)	871	859	646	833
Population (1999)	1,268	1,600	914	1,502
Population growth				
Number of households (2003)	361	365	205	287
Population (2003)	1,742	1,618	1,021	1,355
Overseas workers (2003)	94	83	45	148
Overseas workers as a proportion of total population (2003)	5.4%	5.1%	4.4%	10.9%
Proportion of households with overseas workers (2003)	20.3%	16.4%	20.3%	36.1%
Number of draught 1976–1986	0	4	4	0
Number of draught 1989–1999	2	0	4	0
Number of flood 1976–1986	2	1	1	2
Number of flood 1989–1999	1	8	3	7
Soil type: Percentage of clayee land area (2003)	47%	59%	38%	45%
Soil type: Percentage of loamee land area (2003)	46%	18%	52%	49%
Soil type: Percentage of sandy land area (2003)	4%	20%	10%	6%
Topography: Percentage of upland area (2003)	6%	24%	30%	14%
Topography: Percentage of lowland (not flooded) area (2003)	58%	71%	59%	46%
Topography: Percentage of lowland (>30 cm) area (2003)	36%	5%	11%	40%
Percentage of area irrigated 1970	100%	0%	25%	100%
Percentage of area irrigated 1980	100%	15%	25%	100%
Percentage of area irrigated 1986	100%	15%	25%	100%
Percentage of area gravity irrigated 1999	0%	0%	0	100%

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Table 1. continued

Province Region Island	Village 1 Laguna IV-A (Central) Luzon	Village 2 Nueva Ecija III (Central) Luzon	Village 3 Iloilo VI Panay	Village 4 Iloilo VI Panay
Percentage of area pump irrigated 1999	100%	20%	10%	0
Percentage of area other irrigated 1999	0%	0%	55%	0
Source of irrigation: Percentage of area under gravity irrigation (2003)	10%	0%	27%	78%
Source of irrigation: Percentage of area under pump irrigation (2003)	86%	73%	10%	7%
Source of irrigation: Percentage of rain-fed area (2003)	3%	5%	61%	13%
Land tenure: Percentage area under share tenancy (2003)	3%	1%	57%	13%
Land tenure: Percentage area under leasehold (2003)	62%	10%	8%	23%
Land tenure: Percentage area under CLT (2003)	4%	14%	1%	3%
Land tenure: Percentage area under EP (2003)	0%	17%	0.4%	1%
Land tenure: Percentage area under ownership (2003)	31%	53%	29%	58%
Land tenure: Percentage area pawned-in (2003)	0.4%	6%	4%	2%
Percentage of area adopting modern varieties 1970	22%	5%	5%	100%
Percentage of area adopting modern varieties 1980	100%	100%	55%	100%
Percentage of area adopting modern varieties 1986	100%	100%	60%	100%
Percentage of area adopting modern varieties 1999	100%	100%	100%	100%
Percentage of area using hand tractor 1970	10%	0%	0%	60%
Percentage of area using hand tractor 1980	100%	20%	0%	100%
Percentage of area using hand tractor 1986	100%	100%	0%	100%
Percentage of area using hand tractor 1999	100%	100%	100%	100%?
Percentage of farms adopting direct seeding 1970	0%	0%	5%	20%
Percentage of farms adopting direct seeding 1980	0%	0%	18%	85%
Percentage of farms adopting direct seeding 1986	0%	48%	43%	80%
Percentage of farms adopting direct seeding 1999	0%	5%	100%	100%

Table 2. Composition of Household Consumption by Consumption Quintile

	Total	By per capita consumption quintile				
		1st	2nd	3rd	4th	5th
Rice	15.58%	25.58%	18.82%	15.49%	11.47%	6.56%
Non-rice cereal	4.91%	4.66%	5.36%	5.47%	5.33%	3.74%
Vegetables	7.26%	8.24%	7.31%	7.87%	7.10%	5.77%
Meat	8.78%	6.56%	8.81%	9.61%	9.79%	9.11%
Dairy products & eggs	3.56%	3.21%	3.63%	3.73%	3.78%	3.46%
Fish	6.58%	7.27%	7.89%	6.75%	6.50%	4.50%
Other	7.38%	7.90%	8.40%	8.14%	7.33%	5.15%
Food eaten outside	2.26%	1.06%	2.32%	2.45%	2.74%	2.71%
<b>Total food</b>	<b>59.89%</b>	<b>68.63%</b>	<b>66.11%</b>	<b>63.19%</b>	<b>58.19%</b>	<b>43.37%</b>
Personal care items	5.82%	6.67%	6.78%	5.98%	5.47%	4.22%
Household/kitchen items	0.52%	0.37%	0.05%	0.54%	0.63%	0.61%
Clothing	3.48%	2.54%	3.18%	3.80%	3.70%	4.19%
Transport	3.45%	2.16%	2.82%	3.32%	4.16%	4.79%
Medical	2.32%	0.88%	0.91%	1.69%	2.37%	5.73%
Education	6.81%	6.78%	6.41%	6.49%	6.94%	7.42%
Vehicle	0.31%	0.07%	0.16%	0.17%	0.19%	0.96%
House improvement	2.05%	0.23%	1.00%	1.44%	1.68%	5.87%
Electric items	0.17%	0.01%	0.12%	0.18%	0.14%	0.33%
Community contribution	0.89%	0.72%	0.69%	0.75%	1.01%	1.26%
Wedding, funeral, baptism, etc.	2.17%	0.69%	0.97%	1.94%	2.75%	4.50%
Utility	7.79%	9.05%	8.31%	7.42%	7.65%	6.51%
<b>Total nonfood</b>	<b>40.11%</b>	<b>31.37%</b>	<b>33.89%</b>	<b>36.81%</b>	<b>41.81%</b>	<b>56.63%</b>
Average Total Household Consumption (nominal)	96,959.19	44,886.92	63,532.38	76,086.73	91,249.18	208,827.3

(larger) than one means that the budget share of that particular item tends to decline (rise) as the level of per capita consumption increases. As expected, among food items the share of meat budget increases as a household moves from the lowest to the highest consumption quintile although the magnitude of the increase appears modest (by roughly 40%). The shares of vegetables and fish, in contrast, decline as the level of per capita consumption increases. Although the level of budget share is relatively small, the budget share of ‘food eaten outside (including cooked food taken home)’ increases rapidly as household consumption increases.

The household budget for non-food items increases from 31% among the lowest quintile to 57% among the highest quintile. The consumption items with the highest income elasticities appear to be electric items and house improvements; while their budget shares among the lowest quintile is 0.2% and 0.01%, respectively, they increase to 6% and 0.3%, respectively, among the highest quintile (Table 2). Although the budget share is very small (0.1% among the lowest quintile, 1% among the highest, and 0.3% on average across all classes), the budget for vehicle maintenance also increases quite rapidly as total consumption expenditure goes up (over 10 fold increase, across all villages, as shown in the 1st column of Table 4). Other non-food consumption items with increasing budget shares as expenditure levels increase include, not surprisingly;

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Table 3. Budget Share of Consumption Items: Ratio of the 5th to 1st quintile

	All	Village 1	Village 2	Village 3	Village 4
Rice	0.26	0.30	0.34	0.35	0.17
Non-rice cereal	0.80	0.71	0.73	1.33	0.48
Vegetables	0.70	0.88	0.77	0.71	0.58
Meat	1.39	1.36	1.29	1.36	1.14
Dairy products & eggs	1.08	1.36	0.85	1.32	0.89
Fish	0.62	0.72	0.62	0.86	0.44
Other	0.65	0.61	0.68	0.83	0.52
Food eaten outside	2.57	1.94	1.58	0.96	2.72
Total food	0.63	0.72	0.71	0.72	0.43
Personal care items	0.63	0.66	0.60	0.65	0.55
Household/kitchen items	1.66	1.14	1.30	2.45	2.40
Clothing	1.65	1.26	1.14	1.29	2.01
Transport	2.22	2.07	2.35	1.90	1.73
Medical	6.53	4.37	5.49	11.62	20.57
Education	1.09	0.96	1.31	1.59	0.95
Vehicle	14.55	13.74	12.21	NA	15.44
House improvement	26.05	7.76	5.18	83.86	34.53
Electric items	36.91	1.33	1.48	3.29	20.08
Community contribution	1.75	2.05	1.98	1.88	1.00
Wedding, funeral, baptism, etc.	6.53	6.41	3.49	18.22	34.33
Utility	0.72	0.70	0.74	0.62	0.91
Total nonfood	1.81	1.50	1.64	1.69	2.45
Average Total Household Consumption (nominal)	4.65	4.11	3.49	3.65	6.20

Table 4. Annual Household Rice Consumption by Consumption Quintile

Quintile	No. obs	Value		Quantity		Rice	Household size
		Household total (peso)	Per capita (peso)	Household total (kg)	Per capita (kg)	Unit value (P/kg)	
1st	243	11,059.70	1,910.92	623.17	107.83	17.7	5.88
2nd	244	11,483.17	2,269.99	630.14	125.23	18.2	5.23
3rd	244	11,136.21	2,568.26	591.28	137.57	18.8	4.59
4th	244	9,805.49	2,642.10	517.50	139.70	18.9	3.95
5th	244	10,598.38	2,937.43	554.82	154.03	19.1	3.91
Total	1,219	10,816.30	2,466.20	583.35	132.89	18.5	4.71

clothing (by factor of roughly 2 between the lowest and the highest quintile), transport (also by factor of 2), medical (by factor of almost 7), and personal ceremonies (funerals, wedding, baptism, etc.) (also by factor of 7). In contrast, rather surprisingly, the budget share of education appears to be constant among households belonging to different consumption quintiles (except for village 4, where there is roughly 60% increase between the lowest and the highest quintile). So, in sharp contrast with the medical care expenses, while richer households do spend more amount (in absolute terms) for education, the share in their budget (which could potentially be interpreted as the

Table 5. Composition of Food Consumption: Purchased vs. home production by per capita consumption quintile

	Rice			Vegetables and fruits			Food total		
	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift
1st	60.63%	37.68%	1.69%	62.73%	31.85%	5.42%	76.83%	21.27%	1.90%
2nd	58.07%	39.18%	2.75%	71.20%	24.21%	4.60%	79.98%	17.92%	2.10%
3rd	50.08%	46.70%	3.21%	73.97%	22.72%	3.31%	79.36%	19.03%	1.61%
4th	56.20%	38.98%	4.82%	78.62%	18.06%	3.33%	84.80%	12.76%	2.45%
5th	51.48%	42.74%	5.78%	83.91%	13.97%	2.12%	87.21%	10.72%	2.07%
Total	55.27%	41.07%	3.66%	74.09%	22.16%	3.75%	81.64%	16.34%	2.02%

relative priority the household places on various budget items) is roughly the same as the level observed among poorer households. The variation in the share of community contribution appears to be also surprisingly small across consumption quintiles; wealthier households do not seem to contribute disproportionately larger share, at least in monetary terms, to community affairs compared to poorer households. In contrast, as we noted earlier, wealthier households do allocate much higher shares of their budget toward private ceremonies, such as funeral, wedding, baptism and birthday parties. Wealthier households appear to be much more conscious about the events validating their own social status than about contributions to public goods.

### 3.2 Patterns of Food and Rice Consumption

In this section, we examine the patterns of rice consumption in some detail. Table 4 summarizes the pattern of rice consumption, both in quantity (in kg) and in value (peso) terms, by household quintiles (sorted by per capita consumption expenditures). Since the average size of the household decreases as per capita consumption goes up (as shown in the 7th column), our discussion here focuses on rice consumption per-capita (rather than the household total rice consumption). In both quantity and value terms, per capita rice consumption increases as the level of per capita consumption goes up. On average, per capita rice consumption is about 40% higher among the households belonging to the highest quintile compared to the households belonging to the lowest quintile. The per-kilogram unit value of the rice consumed also increases, though only modestly, as per capita consumption level becomes higher; the ratio of the rice unit values of the highest to the lowest quintiles is 1.08. So, the household members in the highest quintile tend to consume about 40% more (in kilograms) of about 8% higher-valued (in terms of peso unit value) rice.

Table 5 disaggregates the consumption of rice, as well as of vegetables and fruits and of food as a total by source, i.e., purchase, home production and gifts. On average (across all villages), about 40% of rice consumed and about 16% of total food (in value terms) are home produced (Table 5, bottom row). There are relatively small differences in the share of home production across expenditure quintiles. While the shares of home production of fruits and vegetables and food as a whole decline modestly as per capita expenditures increase, such a trend is not observed in the case of rice; the share of home production remains around 40% regardless of consumption quintile.



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Table 6. Composition of Food Consumption: Purchased vs. home production by per capita consumption quintile, by village

Village 1									
	Rice			Vegetables and fruits			Food total		
	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift
1st	76.50%	22.98%	0.52%	73.15%	22.31%	4.54%	86.43%	12.16%	1.40%
2nd	67.89%	30.68%	1.44%	84.72%	13.42%	1.86%	86.94%	12.42%	0.64%
3rd	63.80%	29.40%	6.80%	81.89%	14.66%	3.45%	86.97%	10.82%	2.21%
4th	60.83%	28.99%	10.19%	86.68%	10.44%	2.87%	88.46%	7.95%	3.59%
5th	59.42%	28.73%	11.85%	87.96%	9.03%	3.01%	90.58%	6.19%	3.23%
Total	65.67%	27.16%	6.18%	82.86%	13.99%	3.15%	87.88%	9.90%	2.22%
Village 2									
	Rice			Vegetables and fruits			Food total		
	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift
1st	62.99%	33.09%	3.92%	72.78%	18.20%	9.02%	81.87%	14.48%	3.65%
2nd	60.67%	37.42%	1.91%	75.36%	15.63%	9.00%	82.90%	14.31%	2.79%
3rd	54.54%	42.29%	3.18%	85.24%	9.62%	5.14%	85.66%	12.09%	2.25%
4th	50.30%	48.78%	0.92%	83.00%	12.04%	4.95%	84.90%	12.83%	2.28%
5th	55.69%	39.85%	4.46%	90.44%	6.62%	2.93%	90.26%	7.32%	2.42%
Total	56.84%	40.28%	2.88%	81.37%	12.42%	6.21%	85.12%	12.21%	2.68%
Village 3									
	Rice			Vegetables and fruits			Food total		
	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift
1st	40.38%	59.62%	0.00%	40.34%	56.85%	2.80%	60.26%	38.97%	0.77%
2nd	30.07%	69.93%	0.00%	41.91%	57.41%	0.68%	61.50%	38.12%	0.38%
3rd	21.49%	78.51%	0.00%	46.68%	52.79%	0.52%	62.62%	37.12%	0.26%
4th	45.51%	54.49%	0.00%	55.28%	43.87%	0.85%	75.32%	24.55%	0.13%
5th	38.41%	61.59%	0.00%	57.48%	41.67%	0.85%	76.27%	23.55%	0.18%
Total	34.17%	64.83%	0.00%	48.34%	50.52%	1.14%	67.19%	32.46%	0.34%
Village 4									
	Rice			Vegetables and fruits			Food total		
	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift
1st	51.78%	46.72%	1.49%	52.79%	43.39%	3.82%	70.16%	28.76%	1.07%
2nd	61.98%	30.60%	7.42%	69.83%	24.93%	5.24%	80.75%	14.97%	4.28%
3rd	47.42%	51.56%	1.02%	69.12%	28.09%	2.79%	73.68%	25.33%	0.99%
4th	65.61%	27.90%	6.49%	79.88%	16.54%	3.58%	86.86%	10.25%	2.88%
5th	45.42%	50.69%	3.89%	89.36%	9.75%	0.89%	86.86%	11.62%	1.51%
Total	54.39%	41.56%	4.05%	72.25%	24.50%	3.25%	79.67%	18.19%	2.14%

Table 7. Composition of Food Consumption: Purchased vs. home production by poverty status and by village

	All villages			Village 1			Village 2			Village 3			Village 4		
	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift	Purchase	Home production	Gift
Nonpoor	53.44%	41.65%	4.91%	60.36%	29.72%	9.93%	54.05%	43.08%	2.86%	37.30%	62.70%	0.00%	53.00%	42.31%	4.79%
Poor	58.42%	40.15%	1.43%	72.91%	26.15%	0.93%	64.65%	32.35%	2.99%	33.04%	66.96%	0.00%	57.94%	39.67%	2.39%

Table 8. Share of Net-Rice Buyer Households by Quintile and by Village

Per capita consumption quintile	All villages	Village 1	Village 2	Village 3	Village 4
1st	83.13%	91.67%	84.42%	73.21%	78.95%
2nd	77.46%	83.33%	82.81%	56.86%	82.05%
3rd	70.90%	77.94%	77.38%	48.72%	67.31%
4th	63.52%	67.12%	61.45%	65.62%	60.71%
5th	61.48%	65.52%	66.67%	44.44%	60.78%
Total	71.26%	77.84%	74.52%	59.51%	67.25%

Table 9. Share of Net-Rice Buyer Households by Poverty Status and by Village

	All villages	Village 1	Village 2	Village 3	Village 4
Nonpoor	66.23%	70.14%	70.90%	54.74%	62.32%
Poor	79.74%	88.67%	84.54%	63.64%	80.00%

Table 6 shows the same breakdown for each village. There are large differences in the share of home production across villages, although (as we have just observed) intra-village variations across expenditure quintiles are small in each village. The average share of home production in rice consumption ranges between 27% in village 1 to 65% in village 3. In addition, in village 3, 51% of vegetable and fruits and 32% of all food are home produced, while only 14% of vegetable and fruits and 10% of total food is home produced in village 1. In all villages, the share of home production in vegetable and fruits, as well as total food consumption, declines as percapita expenditure increases. In the case of rice consumption, however, if anything, the share of home production tends to be highest in the middle of consumption quintiles (2nd–4th).

The price of food, especially of the staple food (namely rice), is of a major policy concern, since, as we saw earlier, rice consumption accounts for a sizable share of the household budget (25% in the case of the poorest quintile). While the urban poor unambiguously gain from lower rice prices, the effects of lower rice prices on rural poverty depends on the extent to which the rural poor are net-buyers or net-sellers of rice. Table 7 disaggregates the shares of the sources of rice consumption (i.e., purchased, home production and gift) by poverty status. Across all villages, nearly 60% of all rice consumed among the poor population is purchased while 40% comes from home production. Again there are relatively large variations among villages, however, ranging between 33% purchased rice in village 3 and 73% in village 1.

In terms of gainers and losers of lower (or higher) rice prices, however, a more appropriate indicator would be the share of households who are net-sellers or net buyers

of rice, as shown in Tables 8 and 9. Table 8 shows the proportion of the households who are net-buyers of rice over the 12 month period by percapita consumption quintiles, and Table 9 by poverty status. There is a tendency for the share of net-rice buyers to decline, though gradually, as the level of percapita consumption increases from 83% among the lowest quintile to 61% among the highest quintile (1st column, Table 11). Table 9 shows a similar tendency. Across all villages 80% of the rural poor in our sample villages are net-buyers of rice and thus are likely to gain from lower rice prices. This is in part because farmers are relatively small portion of the rural poor while many are casual laborer households who have no access to agricultural land; among the 483 households living under the poverty line 149 (about 30%) households are farm households including both tenant and owner farmers (not shown in table). Our data also show that even among all farm households (including both the poor and non-poor) roughly 50% of the farm households are net rice-buyers. Among the poor farm households, 60% are net rice-buyers.

It is also important to note, however, that the share of net-buyers of rice among poor households is considerably lower in village 3 (64%) than in other villages (Table 9, 4th column). Combined with the fact that village 3 is the poorest among our sample villages (as we see below), rural poverty could worsen considerably as a result of falling rice prices in the village. Our conclusion thus is; while declining rice prices benefit the overwhelming majority of the rural poor (including poor farmers), there is a possibility of growing pockets of rural poverty in areas where small (and relatively unproductive) farmers who are net sellers of rice account for a sizable share of the poor population.

#### 4. Assessing Living Standards and Poverty

Based on the consumption expenditures obtained with the household questionnaire,<sup>4</sup> we have constructed the estimated annual total household consumption expenditure as a measure of the living standard of each household.<sup>5</sup> The household consumption aggregate was constructed by following the procedures recommended by Deaton and Zaidi (2002). In order to obtain as comprehensive a monetary measure as possible, the construction of the household consumption aggregate involved the following steps:

- Aggregation of annual household consumption expenditures with some adjustments in consumption items to be included
- Addition of the estimated value of services (in terms of annual flows) of asset items owned by the household (i.e., consumer durables and transport equipment, such as cars and motorcycles, and house)

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<sup>4</sup> Appendix 1 discusses the consumption expenditure questionnaire in detail.

<sup>5</sup> Consumption expenditure data serve as a primary measure of welfare level of the household and its members. Based on the permanent income hypothesis, consumption data can be seen as a proxy for the permanent income. Apart from the interest in such 'permanent' income, if we are interested in measuring living standards of a household over a period of one to a few years, consumption measures arguably better reflect their welfare level than (current) income measures do on the ground that people in developing countries can smooth their consumption over a year or more despite their uneven income flows, as well as on more practical reasons regarding data collection. For these reasons, the World Bank has used consumption expenditure data collected from its Living Standard Measurement Study (LSMS) surveys, rather than income data, as a primary welfare measure for a basis for policy formulation. A more detailed discussion of 'consumption versus income' as a measure of household welfare can be found in Deaton and Grosh (2000).

- Adjustments for the cost of living differences across different localities (villages).

#### *Aggregating household consumption expenditures*

Obtaining the annual household consumption aggregate is straightforward in most part. The annual food consumption aggregate is estimated by multiplying the consumption expenditure (including self-consumption of home produced food) in “a typical month” by the answer to the question ‘how many months in the past 12 months did your household purchase?’, adding the value of the gifts received over the past 12 months for each food item, and then summing over all the food items. For non-food items, we can simply aggregate across non-food consumption items the expenditures and the value of the gifts received during the past 12 months. One adjustment needed among the non-food items, however, is to exclude the amount of expenditures for either the items which are considered investments rather than consumption or the items, the expenditures for which cannot be considered as increasing the level of welfare among household members. The expenditures for house construction or improvements, the purchase and maintenance of automobiles, and the amount deposited in the bank fall into the former category, but the monetized values of the ‘services’ from those lumpy goods are included, as discussed in Appendix 2. Also the purchase of ‘lumpy’ goods (or services), such as furniture, and large-scale ceremonial expenses (such as wedding, funeral, baptism) are also excluded on a similar ground.

Also excluded from the consumption aggregate on the latter ground are health-related and medical expenses; the main rationale for excluding health and medical expenditures is that they reflect so called “regrettable necessity” that does nothing to increase the welfare of the household members. This decision is perhaps debatable, however, and the judgment could depend on various factors, including the elasticity of health expenditures with respect to total expenditure (see Deaton and Zaidi (2002) for a detailed discussion). Finally, as a related point, during the consumption interviews, enumerators were instructed to ensure that the consumption expenditures that can be considered as production expenses (e.g., purchase of fuel for the operation of passenger tricycle, any expenditure for agricultural or non-agricultural enterprises) be not included in the consumption survey.

#### *Adjusting for the cost of living differentials across provinces*

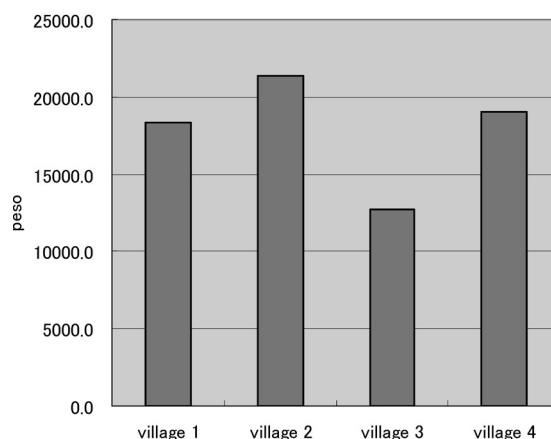
Generally in developing countries, where transportation infrastructure is often poorly developed and markets are segmented across regions, there could be considerable variations in the price of a same commodity in different parts of the country. In order to account for such possibilities, it is desirable to adjust the amount of consumption expenditures based on the cost of living differentials among different localities. To do this, we used the updated version of the provincial cost of living indices (CLI) calculated by Balisacan (2001). Balisacan constructed the CLI based on the Family Income and Expenditure Survey conducted by the National Statistical Office of the Philippine government. The CLI indicates that the general cost of living in the province of Nueva Ecija (where village 2 is located) is 10% higher than that in Laguna province (where village 1 is located) while the cost of living in Iloilo province (where villages 3 and 4 are located) is 22% lower than that in Laguna. CLI was applied to the household consumption expenditure aggregate (but not to the estimated user cost/rental equivalent of household asset items, as discussed in Appendix 2) to adjust cost of living

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Table 10. Per Capita Household Consumption Expenditure by Village

	Consumption expenditure only		Consumption expenditure + user value of assets	
	Without cost of living adjustment	With cost of living adjustment	Without cost of living adjustment	With cost of living adjustment
Village 1	18,294.8	18,294.8	19,906.9	19,906.9
Village 2	21,396.3	19,441.3	22,790.5	20,835.6
Village 3	12,742.2	16,301.2	13,879.1	17,438.1
Village 4	19,081.6	24,411.2	22,011.3	27,340.9
All	18,475.1	19,744.1	20,252.4	21,521.4

Per capita consumption expenditures by village:  
without adjustments



Per capita consumption expenditures by village:  
with adjustments

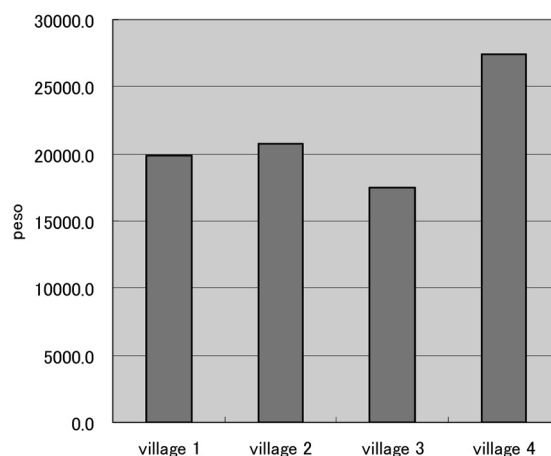


Figure 1. Per Capita Consumption Expenditures by Village

differentials across villages.

*Average per capita household consumption expenditures*

Table 10 summarizes the level of living standards, as measured by the household consumption expenditures per capita, with and without various adjustments described in the previous section. The average consumption expenditure (including the service values of assets and adjusted with provincial cost of living differentials) across all households in the four villages is roughly 22,000 pesos (Table 10, 4th column and bottom row), which translates into roughly US\$400 with the exchange rate of 55 pesos per dollar. The average household consumption per capita, excluding the service values of assets and without adjusting cost of living differentials, is 18,000 pesos (1st column). Table also reports comparisons of the average level of living among the 4 villages. As we can also see with Figure 1, the impression we get about the inter-village comparison of living standards is significantly affected by the presence or absence of the two kinds of adjustments. For example, the level of average percapita consumption expenditures is quite close in villages 1 and 4 (P18,300 vs. P19,100) without the use value of assets and without cost of living adjustments (Table 10, 1st column), but, once the use value of assets are added (but still without cost of living adjustments) the average percapita consumption is now higher in village 4 than in village 1 by roughly 10% (20,000 vs. 22,000) Table 10, 3rd column). This appears to be a result of the particularly high value of the average asset holdings in village 4, as shown in Table A1 in Appendix 2.

The differences that the cost of living adjustments can make in terms of inter-village comparisons is larger than that made by the addition of the use value of assets. The ranking among villages by the average percapita consumption expenditures is reversed between villages 2 and 4. Without adjusting for the cost of living differentials across provinces, the average percapita consumption expenditures is highest in village 2, where the cost of living is also highest among our 4 villages with 10% higher cost of living than in village 1 (the base village). Since the cost of living in village 4 (as well as in village 3) is about 20% lower than that in village 1, adding this adjustment makes village 4 the wealthiest village among the four villages. The (adjusted) percapita consumption expenditure in village 4, P27,341, is roughly 30% higher than that in the next wealthiest village, village 2 (P20,836). Also, the level of living is roughly the same between village 2 and village 1 after the adjustments are made (Table 10, 4th column). It is clear, however, regardless of the adjustments being made, that the village with the lowest average living standard is village 3 (P18,000).

*Poverty measures*

Table 11 summarizes standard poverty measures (the three most common measures in the FGT (Foster-Greer-Thorbeck) family—i.e., head count ratio ('poverty incidence'), poverty gap ('poverty depth') and squared poverty gap ('poverty severity')—) across four villages (See Foster et al. (1984) and Ravallion (1993) for more discussion of alternative poverty measures). The poverty line used here is the official poverty line at the province level for 2003 published by the National Statistical Coordination Board (NSCB).<sup>6</sup> The

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<sup>6</sup> NSCB started publishing poverty lines for each province, rather than for each 'region', relatively recently. The poverty line is based on the caloric requirement of 2,000 kcal per capita and non-food requirement derived from the consumption patterns of households within the 10-percentile around the food threshold. Virola and Encarnacion (2003) outline the methodology used.

## Consumption Behavior and Poverty in the Rural Philippines

Table 11. Poverty Measures by Village

	Provincial cost of living differentials			Headcount		Poverty gap		Squared poverty gap	
	NSCB's provincial poverty line (peso)	Provincial cost of living index by Balisacan	Implied by NSCB poverty line	NSCB provincial poverty line	NSCB Laguna poverty line with coli adjustment	NSCB provincial poverty line	NSCB Laguna poverty line with coli adjustment	NSCB provincial poverty line	NSCB Laguna poverty line with coli adjustment
Village 1	14,616	1	1	0.427	0.427	0.117	0.117	0.047	0.047
Village 2	14,342	1.101	0.981	0.277	0.367	0.072	0.100	0.025	0.037
Village 3	12,275	0.782	0.840	0.556	0.527	0.178	0.151	0.074	0.060
Village 4	12,275	0.782	0.840	0.289	0.247	0.085	0.071	0.036	0.030
All	—	—	—	0.371	0.383	0.106	0.106	0.043	0.042

nominal percapita household consumption expenditure aggregates (without cost of living adjustments) are compared to the provincial poverty line to obtain poverty measures. As a less satisfactory alternative, percapita consumption expenditures with cost of living index adjustments (calculated by Balisacan using 2003 FIES) could be compared to the base province (in our case Laguna) poverty line from NSCB, and the results are also reported in the table (reported in 5th, 7th and 9th columns of Table 11). The cost of living indices by Balisacan and the cost of living differentials implied by NSCB poverty line are reported in the 2nd and 3rd column, respectively. While the cost of living is higher in village 2 (Nueva Ecija) than in village 1 (Laguna) by 10% based on Balisacan's COLI, the estimated cost of living in village 2 is slightly (by 2%) lower than in village 1 based on NSCB's poverty lines. In addition, while the cost of living in villages 3 and 4 (Iloilo) is lower than the other 2 villages in Luzon, the magnitude of the difference is larger based on Balisacan's COLI (22% lower compared to Laguna) than that based on NSCB's poverty line (16% lower). The main source of the difference is likely to be the difference between the consumption baskets of the households whose income level is close to the poverty line (used for deriving provincial poverty lines by NSCB) and the consumption basket averaged across all income levels (which is the basis for the provincial cost of living indices derived from FIES by Balisacan).

The NSCB includes imputed rent of owned house in the consumption basket used for calculating poverty lines. Thus the appropriate consumption aggregate for deriving poverty measures is the total household consumption (including all consumption items but excluding savings and taxes) plus the estimated rental equivalent of houses.

Across all villages 37% of the total households lived below the poverty line in 2003 in our survey villages (the bottom row of the 4th column in Table 11). There are large differences among villages, however. The poverty headcount is highest in village 3 with a 56% headcount ratio, followed by village 1 with 43%. The incidence of poverty is much lower in villages 2 and 4 (28% and 29% respectively), roughly a half the headcount ratio in village 3 (Table 11, 4th column). The ranking among villages based on the level of poverty is not affected by the use of alternative poverty measures, however (6th–9th column, Table 11).



Table 12. Inequality Measures: Distribution of per capita consumption expenditures

Welfare measure	Per capita consumption (without asset flows)				Per capita consumption (with asset flows)			
Inequality measure	Coeff. Of variation	Gini coeff.	Theil entropy	Atkinson	Coeff. of variation	Gini coeff.	Theil entropy	Atkinson
Village 1	0.653	0.310	0.167	0.145	0.701	0.330	0.190	0.163
Village 2	0.710	0.321	0.185	0.153	0.760	0.338	0.207	0.169
Village 3	0.619	0.296	0.152	0.133	0.692	0.313	0.177	0.149
Village 4	0.623	0.322	0.169	0.159	0.767	0.361	0.225	0.196
All	0.677	0.325	0.181	0.157	0.767	0.349	0.216	0.179

### *Inequality in the distribution of per capita consumption expenditures*

Table 12 reports summary measures of inequality in the distribution of percapita consumption expenditures among households. Based on percapita consumption expenditures, inclusive of rental equivalent of household assets and adjusted with COLI (reported in the 5th through 8th columns of Table 12, as well as Figure 2-B), the level of inequality is highest in village 4 and lowest in village 3. Thus, village 4 has the highest average consumption expenditures percapita but also the highest level of inequality, while village 3 has the lowest average consumption expenditure percapita but the lowest level of inequality. The level of inequality in villages 1 and 2 is in between those of villages 3 and 4.

Once inequality measures are calculated based on percapita consumption expenditures without rental equivalent of household assets, however, inequality comparisons among villages becomes ambiguous. As we can see in Figure 2-A, the Lorenz curves for the four villages intersect with each other. As a result, the ranking of the villages according to summary inequality measures is sensitive to the choice of specific inequality measures.<sup>7</sup> For example, and rather surprisingly, village 4 is found to be the village with the highest inequality based on Gini coefficient and Atkinson's measure but also the village with 2nd lowest inequality (after village 3) based on the coefficient of variation.

## **5. Correlates of Percapita Consumption Expenditures**

Some initial attempts are made to identify main correlates of the level of living standards using a simple multiple regression analysis. Here we follow a common approach of regressing the level of welfare (measured by household consumption percapita) on household endowments, such as land, human capital and labor endowments and life cycle stages (by controlling for the age of the household head). The dependent variable used here is the logarithm of percapita consumption expenditure (adjusted with cost of living differentials across villages) and right hand side variables in our base model are: size of land owned (in hectares), years of schooling of the household head, age of the household head, age of the household head squared, household size, household composition (measured by the number of household members in

<sup>7</sup> See Sen (1973), for example, for a detailed discussion of alternative inequality measures.



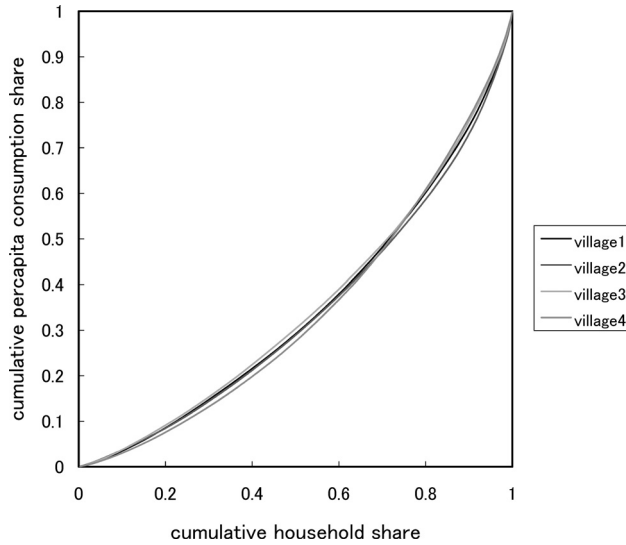


Figure 2-A: use value of assets not included

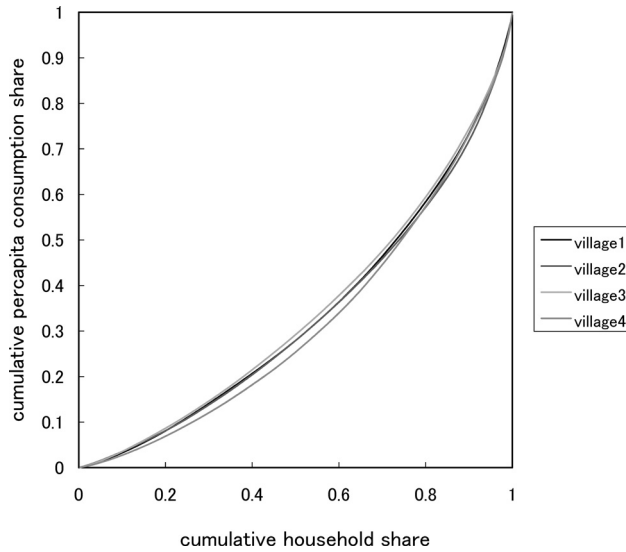


Figure 2-B: use value of assets included

Figure 2. Lorenz Curves by Village

specific age and gender categories) and village dummies (village 1 is the reference village). Since there is a possibility that the asset returns are nonlinear, we follow Finan, Sadoulet and de Janvry (2005) and initially estimated the relationship between per capita expenditures, on the one hand, and landholding and the schooling of the head, on the other, based on nonparametric regression (Lowess smoothing), as displayed in Figures 3 and 4. The degree of nonlinearity appears to be weak in the effects of the size of land ownership on percapita expenditures (Figure 3), in sharp contrast with the Mexican case reported in Finan, Sadoulet and de Janvry (2005). In the case of the effects

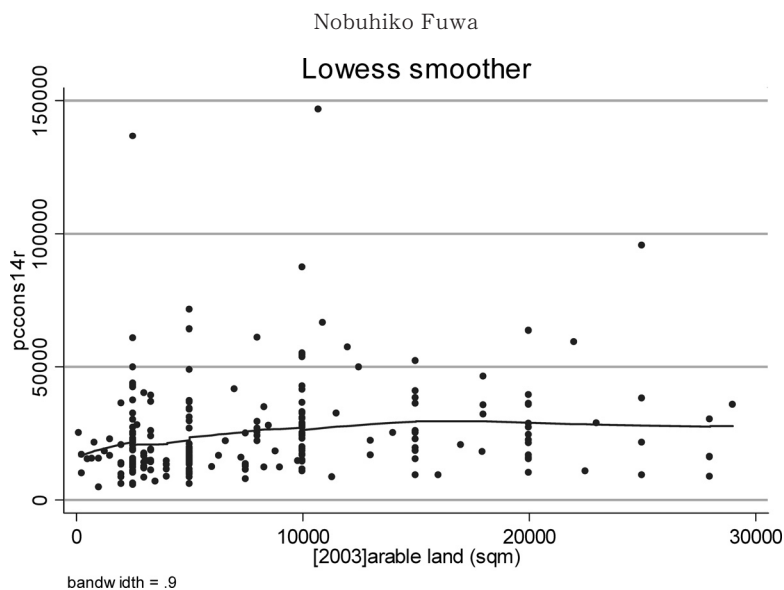


Figure 3. Nonparametric Regression: percapita consumption expenditure on the size of land owned

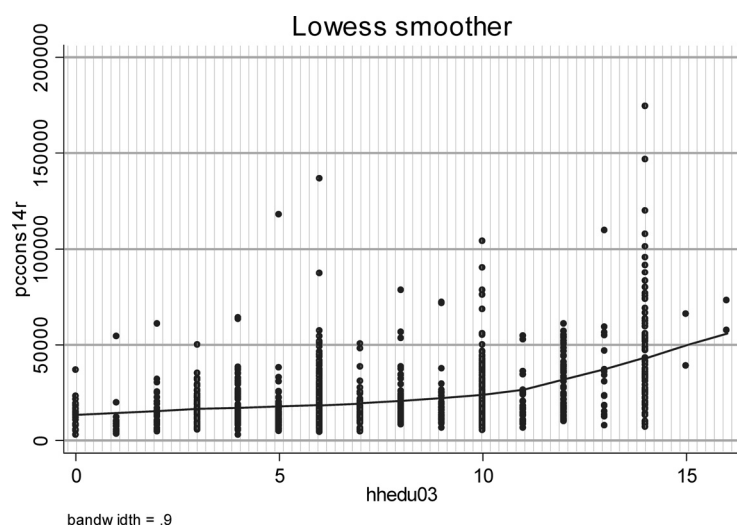


Figure 4. Nonparametric Regression: percapita consumption expenditure on years of schooling

of schooling on percapita consumption (Figure 4), however, there is a clear kink (increase) in the returns to education at the college level compared to the level below. We thus add an interaction term between the years of college schooling of the head and a dummy variable for college level education as an additional regressor while the size of landholding is entered linearly in the regression. Regression coefficients are estimated by least absolute deviation (LAD), rather than OLS, due to its robustness property.<sup>8</sup>

Regression results are summarized in Table 13. Our base specification results (1st

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<sup>8</sup> LAD (least absolute deviation) estimation tends to yield more robust estimates than ordinary least squares (OLS) with smaller influence of outliers (e.g., Deaton 1997).

Consumption Behavior and Poverty in the Rural Philippines

Table 13. Correlates of Per Capita Household Consumption (LAD)

Dependent variable=log (per capita household consumption expenditure)

	(1) Base model	(2) Female head (FHH)	(3) FHH+ overseas worker (OFW)	(4) FHH+OFW +FHH* OFW
Agricultural land owned (ha)	0.0859 (6.76)***	0.1004 (8.26)***	0.0852 (7.43)***	0.0809 (6.25)***
Years of schooling of head	0.0531 (12.44)***	0.0535 (13.35)***	0.0452 (11.69)***	0.0450 (10.31)***
Years of collage schooling of head	0.0767 (5.84)***	0.0619 (5.00)***	0.0628 (5.29)***	0.0782 (5.86)***
Age of household head	0.0155 (3.17)***	0.0116 (2.41)**	0.0169 (3.83)***	0.0199 (3.87)***
Age of household head squared	-0.0001 (1.60)	-0.0001 (1.22)	-0.0001 (2.95)***	-0.0001 (3.08)***
Household size	-0.0976 (14.39)***	-0.0884 (13.46)***	-0.0887 (14.16)***	-0.0914 (12.89)***
Household composition				
Male 0-15	-0.2520 (3.16)***	-0.4040 (5.19)***	-0.3737 (5.02)***	-0.3440 (4.10)***
Male 66-	-0.3391 (2.38)**	-0.1304 (0.94)	-0.051 (0.42)	-0.0360 (0.24)
Female 0-15	-0.2849 (3.47)***	-0.4156 (5.21)***	-0.4013 (5.28)***	-0.3496 (4.09)***
Female 16-65	0.1427 (1.80)*	.0079 (0.10)	0.0409 (0.53)	0.1399 (1.61)
Female 66-	-0.3488 (3.35)***	-0.5249 (4.87)***	-0.3989 (3.93)***	-0.2352 (2.06)**
Female head		0.1655 (4.23)***	0.1367 (3.66)***	-0.0202 (0.39)
Overseas worker			0.2808 (11.21)***	0.2281 (7.26)***
Overseas worker* female head				0.3333 (4.83)***
Village 2	-0.0400 (1.34)	-0.0691 (2.46)**	-0.0484 (1.81)*	-0.0418 (1.38)
Village 3	-0.1347 (3.85)*	-0.1557 (4.73)***	-0.1293 (4.10)***	-0.1157 (3.26)***
Village 4	0.1243 (3.56)*	0.0876 (2.88)***	0.0654 (2.25)**	0.0894 (2.73)***
Constant	9.3059 (69.53)***	9.887 (73.19)***	9.3921 (77.43)***	9.2934 (66.81)***
Pseudo $R^2$	0.2456	0.2483	0.2740	0.2778
Number of obs.	1,218	1,218	1,218	1,218

\* Statistically significant at 10% level

\*\* Statistically significant at 5% level

\*\*\* Statistically significant at 1% level

column) are fairly standard. Both land and education are positively correlated with the level of household welfare, and household size negatively correlated. Additional child (age 0 to 15) and additional elderly members (above 65) in the household composition is

negatively correlated with percapita consumption levels relative to a household member who is prime age male (reference group). As we saw in the nonparametric regression, the returns to college education is significantly higher than the returns to schooling below college level; while an additional year of schooling (elementary and high school) is associated with 5% increase in percapita consumption, the returns to additional year of college education is higher by 8 percentage point. The stage in the households head's life cycle (as shown in the coefficients of the age of household head and its square) is also significantly correlated with percapita consumption, which tends to increase as the head becomes older but with diminishing rate (the turning point is at age 98). After controlling for household characteristics, the percapita consumption of households in village 3 is lower by 12% than those in village 1 while the percapita consumption of households in village 4 is higher by 12%.

In policy circles, concerns often arise as to whether (and to what extent) female headed households are disadvantaged vis-à-vis their male headed counterparts. In the case of the Philippines, however, female headship has often been found to be positively (rather than negatively) correlated with the level of household welfare (e.g., Balisacan). As shown in the 2nd column of Table 13, if a dummy variable for female headed households is added, it is significantly positively correlated with percapita consumption. Female headed households are, however, a heterogeneous group with different reasons for becoming female headed, which in turn determines its relationship with the level of welfare (e.g., Fuwa 2000). In the case of the Philippines, a main reason for the female headship is international labor migration of the male head of the households. As we can see in the 3rd column, however, adding a dummy variable for the presence of household member working abroad does not change the positively significant correlation between female headship and percapita consumption.

Once an additional interaction dummy variable between female headship and international labor migration is added, then the point estimate of the coefficient for the female headship dummy becomes negative and is no longer significantly different from zero. A series of results suggest that having a household member abroad (and receiving remittances) is associated with 22% higher percapita consumption, and, in addition, having the male head of households (rather than the wife, or children) working abroad is associated with *additional* 35% increase in percapita consumption. Once those factors are controlled for, female headship (without involving international labor migration) has little (or potentially negative) association with the level of household welfare.

## 6. Summary and Policy Implications

This paper described consumption patterns and poverty situations of rural households in four villages with different rice ecosystems, and identified household-level correlates of living standards of rural households (as measured by percapita consumption expenditures). This final section summarizes our findings, followed by some policy implications.

### *Living standards in the four sample villages*

Four sample villages were selected, each representative of differential rice-ecosystems as well as of different socioeconomic conditions. Two villages are in Luzon and two are in Panay island. Village 1 in Laguna province is increasingly having

suburban characteristics, rather than those of pure rural villages, due to its relative proximity to the Metro Manila region, and is dominated by non-farm households. Despite its relative proximity to the national capital, however, the rate of poverty is relatively high. Village 2 is located in the Central Luzon plain in the province of Nueva Ecija and is also a rain-fed village, but village 2 is wealthier on average than village 1, and inequality within the village is also lower. The other two villages are located in the province of Iloilo on Panay island. Village 3 is located in a relatively remote and upland area where agricultural productivity tends to be lower. In village 3 the share of home consumption of rice production is highest, and the average living standard is lowest among all sample villages but also inequality within the village is low. In contrast, village 4 is under the most favorable conditions in terms of rice production among the four sample villages; village 4 is served with a well-functioning irrigation system with a possibility of triple cropping. Village 4 has the highest living standards on average but inequality within the village is also the highest among the four villages. The high average living standard in village 4 is a result not only of its favorable rice ecosystem but also of its high share of household members working abroad (especially seafarers).

*Behavioral characteristics of rural households*

We find that the average consumption expenditure percapita (which is a proxy measure of average household income percapita) in the four sample villages as of 2003 was 22,000 pesos (US\$400). Across the four villages, 37% of the sample households suffered from absolute poverty. The poverty rate is substantially higher, however, with 56% in village 3 and with 43% in village 1. On the other hand, poverty incidence is relatively low in village 4 (29%) and village 2 (28%).

On average, 60% (70% among the poorest quintile) of the total household budget is spent for food and 16% (26% among the poorest quintile) is accounted for by rice. As expected, the budget share of meat increases as a household becomes richer and also 'food eaten outside' also increases rapidly. Non-food consumption items with high income elasticities include: electronic items, house improvements, vehicle maintenance, clothing, transport, medical, and personal ceremonies.

While the shares of most of non-food consumption items increase as household income increases, the budget share of education (roughly 7%) remains constant across consumption expenditure quintiles, in sharp contrast with the share of health (medical) expenditures which increases sharply as percapita consumption level increases; this suggests that even relatively poorer households place high priority on education. Wealthier households do not spend larger shares of consumption budget on community affairs than do poorer households, although they do spend disproportionately larger shares of their budget on private ceremonies such as wedding, funeral, baptism and birthday parties. This suggests that wealthier households are more conscious about the events validating their own social status than about contributing to local public goods.

We find, as expected, that a substantial proportion of food consumed by rural households is produced by their own farms. On average, 40% of rice and 16% of food are home produced, and the share of home production does not differ much across consumption quintiles (i.e., between the poor and the rich). However, the share of home production in rice ranges widely between 27% in village 1 and 65% in village 3. We further find that as much as 80% of the rural poor are net rice buyers (although the

share is lower at 64% in village 3). While 30% of the poor are farm households (and the remaining 70% are landless laborer households), 60% of the poor *farm* households are net rice buyers.

Multiple regression results suggest that years of schooling and landholdings are positively correlated, and larger household sizes negatively correlated, with higher living standards. Similar results have been found almost universally in many developing countries. We also find that an additional year of college education has higher returns than that of lower levels of schooling. A characteristically Philippine phenomenon is the prevalence of international labor migration, and having household members working abroad is found to be associated with 22% higher percapita consumption expenditure. On the other hand, female headed households do not have significantly lower living standard than male headed households once other household characteristics are controlled.

#### *Policy implications*

While many of the findings are quite standard and thus not new, there are a few policy implications arising from our descriptive analysis. One has to do with food prices. While it is clear that rising food prices are harmful for urban poor, whether rising prices of staple crops are detrimental to the welfare of poor rural households who are directly involved in the production of such crops is often debated. In principle, whether rural poverty increases or decreases due to higher food prices is an empirical question depending on whether more of the rural poor are net food buyers or sellers. If the former (latter) dominates, then rural poverty is likely to increase (decrease) due to higher food prices. In the case of rural Philippines, we find that the majority of the rural households are net rice buyers. A great majority (70%) of the rural poor are landless laborer households, rather than farm households, and even among the poor farm households, 60% are net rice buyers. Thus, in the rural Philippines rising rice prices are likely to be harmful to the majority of the rural poor. We should note, however, that the proportion of the rural poor who are net rice buyers vary substantially across our sample villages, and that there is a possibility of growing pockets of rural poverty in areas where small (and relatively unproductive) farmers who are net sellers of rice account for a sizable share of the poor population.

Second implication is a cautionary note for interpreting data. We find that some of the measures of living standards and of inequality are somewhat sensitive to the way technical adjustments (e.g., cost of living differentials across regions, and estimation of the use values of durables) are made. We find, for example, that the ranking of the sample villages based on the average consumption expenditures is somewhat sensitive to the adjustment of cost of living differentials with some rank reversals, and that village rankings based on the degree of inequality in consumption expenditures are also sensitive to the choice of particular inequality measures. Policy makers would need to interpret data carefully, and robustness needs to be checked before policy priority is determined, especially while designing policy interventions involving geographical targeting.

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## APPENDIX 1: The Survey Instrument for Capturing Consumption Expenditures

The survey instrument we used for the 2003 consumption expenditure survey was based on the standard format used by the World Bank's Living Standard Measurement Studies (LSMSs). For purchase of consumption goods, the recommended LSMS template (Deaton and Grosh 2000) has two separate (instead of just one) reference periods: past two weeks and a 'typical one month' period for food items and past 30 days and past 12 months for non-food consumption items. The questionnaire has separate columns for purchase, consumption of home production and gifts. In our case, the 2003 survey included additional 7-day consumption diary, which was conducted in 1992 and 1997 (but not in 2001) in order to measure consumption growth. We thus decided to retain the 'typical one month' reference period for food items (while the possibly more detailed and accurate consumption expenditures with a shorter reference period was captured by the consumption diary). For non-food items, which tend to be purchased less frequently and thus are less likely to be well captured (compared to food items which tend to be purchased more frequently) by the 7-day consumption diary, we retained the both 'past 30 days' and 'past 12 months' reference periods, following Deaton and Grosh (2000).



The list of consumption items in the questionnaire was initially drawn from the questionnaire used for the Family Income and Expenditure Surveys, conducted by the National Statistical Office of the Philippine government in every 3 years. Typically LSMS consumption survey questionnaires are considerably shorter than typical household budget surveys conducted by national governments. While the recommended LSMS template drafted by Deaton and Grosh (2000) includes 40 food items and 54 non-food items, the 2000 FIES questionnaire for consumption expenditure contains 150 food items and 225 non-food items. We have grouped together items and collapsed some item categories to reduce the length of the questionnaire and to make it closer to the typical LSMS format. As a result, we have reduced the number of food items from 150 to 94 and non-food items from 225 to 74.

## APPENDIX 2: Estimating User Costs of Household Assets

Consumer durable goods (as well as house and transport equipment such as motorcycles and automobiles) last for many years and it is not the purchase of those goods but rather the use (service flows) of them that constitutes welfare. For example, when a household purchases a TV set for 20,000 Pesos in year 2000, the services that the household derives from it will last for several years. Based solely on the purchase of a TV, however, the 20,000 peso purchase of the TV would be included in the total consumption expenditure of year 2000 and, of course, zero value of TV would be included in the consumption expenditure (since no TV purchase occurs) in the subsequent years even though the household enjoys the same amount of services from the TV in those subsequent years as they did in year 2000. Thus, special treatment is necessary in order to account for the level of welfare the household derives from the possession of household assets, although this adjustment is not always done (or done properly) in typical household surveys (even among World Bank's LSMSs). We excluded the purchase (as well as the maintenance costs) of consumer durables, house and transport equipment, from the aggregate household consumption, as mentioned above, but then added the estimated use value of household assets taken from the inventory of household assets. We estimated the use value of household assets (consumer durables and transport equipment such as automobiles, motorcycles and bicycles) with the following procedures as suggested by Deaton and Zaidi. Based on the acquisition cost, the year of acquisition and the current value (based on the respondents' subjective estimates) in the data, we first calculate item-specific depreciation rates ( $\delta_j$  for consumer durable item  $j$ ) for each consumption item for each household using the formula:

$$\delta_j - \pi = 1 - (P_{jt}/P_{j(t-T)})^{1/T},$$

where  $\pi$  is the rate of inflation,  $P_{jt}$  is current value of item  $j$ ,  $P_{j(t-T)}$  is the purchase price,  $t$  is year 2003 and  $T$  is the number of years since item  $j$  was initially purchased. We then take the median values of  $(\delta_j - \pi)$  across all households for each item (instead of using the actual household-specific depreciation rate calculated), which was then used to estimate the "user cost" or "rental equivalent" of each durable good item using the following formula:

$$\text{user cos } t_j = P_{jt}[r_t - \pi + \delta_j],$$

where  $r_t$  is the general nominal interest rate in 2003, for which we used the value of 10.7% based on the average 91 day treasury bond rate in year 2003. The empirically



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Table A1. Average Current Value of Consumer Durable Items by Village (Peso)

	TV*	VCR*	Refrigerator*	Radio cassette*	Washing machine*	Coking range*	Electric fan*	Karaoke*	Motor cycle*	Automobile*	Total asset
Village 1	2,784	4,472	4,688	1,167	1,789	1,183	686	2,069	42,055	86,053	17,723
Village 2	3,609	4,138	4,849	1,086	1,982	1,182	645	3,177	43,169	139,063	18,507
Village 3	6,505	8,485	6,653	880	3,250	1,837	787	3,175	53,700	200,000	12,688
Village 4	7,087	9,367	5,504	1,732	3,175	2,504	965	4,147	53,833	352,273	41,228
All	4,447	6,219	5,241	1,247	2,195	1,460	743	2,837	44,843	203,443	22,645

\* Average values calculated using observations with positive values only.

estimated depreciation rates for consumer durables mostly fall in the range between 0.1 and 0.2, which appears reasonable and comparable to those obtained in typical LSMS surveys, and 0.06 to 0.08 for automobiles. We could essentially make similar calculations for the rental equivalent of housing. However, unlike the case of consumer durables, many houses were constructed many years ago, and thus the valuation of the initial costs appears not reliable in many observations. As a result, we decided to use a simpler method, used for the Vietnam LSMS by the World Bank, and obtained the estimated rental equivalent by simply multiplying the estimated current value of the house by 0.03 (see Deaton and Zaidi for a discussions of alternative methods for estimating rental equivalent of housing).

Table A1 summarizes the current values of major/selected household asset items, which were a basis for the estimated use values. The average value of total asset holding is substantially higher in village 4 (P41,228) compared to the average asset values in other villages (P13,000 to P18,000), and the those values are positively correlated with the level of consumption expenditures. Furthermore, looking at the value of individual durable items, there appears to be a systematic tendency for the villages in Iloilo (villages 3 and 4) to have substantially higher unit values for most of electric appliances (with the exception of radio/radio cassette recorders and karaoke machine). Since village 3 in many measures is the poorest village among our sample villages, the fact that the value of those items are systematically higher in both village 3 and village 4 (and the values in village 4, the wealthiest among the 4 villages in many measures, tending to be systematically higher than those in village 3) seems to imply that the costs of consumer durables tend to be higher in Iloilo villages than in Luzon villages. While such differential could potentially arise if those items have been purchased more recently in Iloilo villages than in Luzon villages, our data generally do not show systematic differences among villages in the average age of consumer durables held by the households, except for the case of automobiles (cars, trucks, jeeps, etc.); the mean purchase year of automobiles (with the number of observations in parentheses) is 1996 (19), 1998 (16), 2000 (4) and 1997 (22), in villages 1, 2, 3 and 4, respectively. Thus the relatively high average value of automobiles held in village 3 is likely to be partly due to the fact that they are of newer vintages. Based on interviews with retail shops in Iloilo city and in Cabanatuan city (in Nueva Ecija where village 2 residents typically purchase those goods) as well as with the village residents, we find that the unit prices of consumer durables tend to be higher in Iloilo (villages 3 and 4) because the majority of the residents in villages 3 and 4 purchase appliances on

Table A2. Average Estimated Use Value of Assets (Annual Flow) by Village (Peso)

	All consumer durables		Car, bicycle, motorcycle		House	Total	Total household consumption expenditure	Ratio of user cost of assets to total household consumption
	(Average across all observations)	(Average among non-zero observations only)*	(Average across all observations)	(Average among non-zero observations only)*				
Village 1	1,390.6	1,629.9	2,034.9	6,930.3	2,819.1	6,236.9	80,840.2	0.077
Village 2	1,093.7	1,559.4	2,362.8	5,866.8	1,892.1	5,348.6	86,849.0	0.062
Village 3	1,153.2**	1,545.2**	1,141.8	16,718.6	2,543.6	3,988.1**	59,041.7	0.068
Village 4	1,916.6**	2,444.7**	5,151.5	30,173.3	5,205.2	9,883.3**	83,035.3	0.119
All	1,385.6	1,791.6	2,717.2	10,473.3	3,057.4	6,451.4	79,489.2	0.081

\* average values calculated using observations with positive values only.

\*\* use values of consumer durables in villages 3 and 4 are deflated by the factor of 1.3 in order to adjust for the differences in unit prices. See text for details.

installment basis while Luzon village residents purchase mostly on cash basis.<sup>9</sup> Based on our price survey of major appliances (TV sets, washing machines and refrigerators) the average prices of appliances (for the exact same models) appear to be higher by 30% to 40% in Iloilo City compared to those in Cabanatuan city.<sup>10</sup>

Thus, the adjustment of consumption expenditures using the cost of living indices (COLI), which indicate that the cost of living is lower in Iloilo villages than in Luzon villages by more than 20% (as discussed immediately below), was applied only for the consumption purchases while the rental equivalent of asset items in Iloilo villages (villages 3 and 4) was deflated by the factor of 1.3. Those deflated values are reported in the parentheses of Table A1. Table A2 summarizes the results of calculating user cost/rental equivalent of household assets for the four villages. The estimated total user cost of household assets (including consumer durables, automobiles and houses) corresponds to roughly 10% of total household consumption expenditures. Across villages, the share is substantially higher in village 4 (12%) than in other villages (6% to 8%) (last column of Table A2).

<sup>9</sup> Our interview with the regional manager of a major retailer of consumer durables in Iloilo City (as of 2005) revealed that about 60% to 70% of their store's sales were on installment basis while installment purchase is not available in appliance stores in Cabanatuan (Nueva Ecija). This pattern was also confirmed by our interviews with villagers.

<sup>10</sup> The price survey was conducted in 2005 (instead of 2003). The prices in Cabanatuan city were all cash basis (since installment purchase was typically not available) while the prices in Iloilo City were based on the weighted average of cash and installment prices (with the weight between the cash prices and the installment prices being 0.3 and 0.7, respectively).