

The Rice-Based Farm Household Survey 1996-2007

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ABSTRACT

This article describes in detail the data generation process of the Rice-Based Farm Household Survey. The origin of the survey was traced and its evolution into generating panel data of rice farming households is discussed in depth. The sampling procedure and its limitations are also reviewed methodically from the original size of 2,500 down to 2,000. Complementary sources of data that were used in the book are also briefly discussed. The review shows that while data generation was costly and laborious, the wealth of farm-level data and the numerous insights derived from it can be tremendously useful to understanding the status of rice farming in the country. Given this, the survey must be continued as a research tool provided that its processes are improved.

Keywords: *rice-based farm household survey, sampling procedure*

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THE ORIGIN

The Social Science and Policy Research Division (SSPRD) of the Philippine Rice Research Institute (PhilRice) in collaboration with the Bureau of Agricultural Statistics (BAS) surveyed rice-farming households in 15 major rice-producing provinces during the wet season (WS) of 1992 and dry season (DS) of 1993. The sample provinces comprised around 50% of the country's total rice area harvested.

Due to the importance of the survey-generated information, the SSPRD and BAS cooperated once more on the project *Regular Monitoring of Rice-Based Farm Households* (Briones et al. 1997). More provinces were covered and the sampling frame of the survey was improved. The project aimed to give a comprehensive picture of the social, economic, and technological status of the rice production sector in the Philippines. To do this, SSPRD developed a survey form for farm households that planted rice solely or in combination with other crops, while BAS conducted the actual interview. A total of 2,500 rice-based farming households (RBFH) were interviewed in 30 major rice-producing provinces. The initial survey round covered the 1996 WS and the 1997 DS harvests.

Data gathered included farmer characteristics, description of farm parcels, methods of crop establishment, farm inputs and crop management practices, labor requirements, postharvest practices, production costs, sources of farm financing, production problems, and sources of information. Originally designed for developing profiles of rice farmers in

strategic rice-producing provinces and for identifying technology needs in rice production, the generated data helped in refining the rice research and development process. In addition, the wealth of RBFH Survey (RBFHS) data lent itself for the analysis of various issues surrounding the rice sector that eased policymaking. The *Impact of Peso Devaluation on the Profitability and Global Competitiveness of the Rice Sector* (Gonzales 2000) and the *Technical and Allocative Efficiencies of Philippine Rice Production* (Gonzales et al. 2004) studies intensively used the 1996-1997 RBFHS data. For easier access to rice information, SSPRD also used the RBFHS data in developing the *Rice-Based Socioeconomic Information System* (RBSEIS) through the *Oracle®* software, but this project failed due to slow computing technology at the time.

Due to the usefulness of the generated data, the Socioeconomics Division (SED), formerly SSPR, made the RBFHS quinquennial. The second round was conducted in 2002 to cover 2001 WS and 2002 DS harvests. Farmer-respondents in 1996-1997 were re-interviewed. Those who dropped out of the sample were replaced in order to maintain the original sample size (Mataia and Cataquiz 2002), thus creating an unbalanced panel data. Furthermore, data on household characteristics of the replacements in the 2002 DS survey were not properly collected adding to the limitations of the RBFHS data.

In the 2001-2002 survey, Davao Oriental was included because of its strategic importance to hybrid rice commercialization, thus covering 31 major and potential rice-producing provinces (PhilRice 2002). The sample size was also increased from 2,500 to

2,585 respondents. The generated data in the two rounds of RBFHS were exhaustively used in the book *“Why Does the Philippines Import Rice?”* (Dawe et al. 2006).

In 2007, the third round of RBFHS was conducted covering 2006 WS and 2007 DS harvests. Some of the provinces covered in previous surveys were separated into distinct political boundaries such as Davao del Norte and Compostela Valley, and Zamboanga del Sur and Zamboanga Sibugay (Malasa et al. 2007). To continuously monitor the farmer-respondents in these areas, these provinces were maintained in the coverage area although they no longer fell under the definition of major rice-producing provinces. This brought the coverage area of the RBFHS into 33 major and potential rice-producing provinces.

Despite the practicality and advantages of having the RBFHS, generating panel data was a costly activity. In 2007, the budget allotted for the project was significantly reduced resulting in a trimmed-down sample size. For the 2006 WS and 2007 DS rounds, the same number of provinces was maintained but the number of respondents was reduced to 2000² (PhilRice 2007). As a result, the 2006-2007 survey data could no longer be used in profiling some provinces, but it still gave an accurate representation of the rice industry at the national level.

Notwithstanding the limitations of the data, no other farm-level dataset on rice production and management was as comprehensive as the one generated by the

² One of the filled-up survey returns in 2006-2007 RBFHS round was lost due to mishandling, which further reduced the actual sample size to 1,999 respondents.

RBFHS. Using appropriate analysis, the RBFHS data can yield plenty of insights on understanding and improving the country's rice production. To uncover those insights, the papers in this book made heavy use of the data gathered in the three rounds of RBFHS.

SAMPLING PROCEDURE

The *Regular Monitoring of Rice-Based Farm Households* project originally set a quota sample of 2,500 to statistically represent the national rice industry and each major rice-producing province while satisfying the budget constraint. The project adopted a two-stage sampling procedure (PhilRice 1997) where the province was the domain of the study. The village (*barangay*) was the first-stage sampling unit and the rice-based farm households as the second-stage sampling unit. Target provinces were selected based on five-year averages of rice harvest area; villages were selected using simple random sampling; and sample respondents in each village were selected using the right coverage approach.

Step 1: Province Selection and Sample Allocation

Thirty major rice-producing provinces were selected based on the ranking of five-year averages of rice harvest area from 1992 to 1996. Provinces were arrayed in descending order and divided into four strata in approximately equal share to the total harvest area in 30 provinces (about 25% each stratum). The first stratum included Pangasinan³ and

³ Due to human error, the 5-year average of Pangasinan's production was used instead of harvest area, inadvertently ranking the province as first when it should only be fourth. This error was discovered during

Nueva Ecija; the second was composed of Iloilo, Isabela, Camarines Sur, and Cagayan. Tarlac, North Cotabato, Maguindanao, Leyte, Zamboanga del Sur, Bulacan, Oriental Mindoro, Bohol, and Bukidnon constituted the third stratum. The fourth consisted of Sultan Kudarat, Occidental Mindoro, Quezon, Albay, South Cotabato, Pampanga, Davao del Norte and Sur, Ilocos Norte, Northern Samar, Agusan del Norte and Sur, Laguna, Zamboanga del Norte, and Aurora (Table 1).

Initially, the project proportionally allocated sample respondents to each province relative to its contribution to the total harvest area of the 30 provinces. However, this led to a too small sample size for some of the target provinces. Using the Delphi method (consensus-building), uniform sample sizes across provinces in each stratum were set at 155, 120, 90, and 60, for the first, second, third, and fourth strata, respectively. This provided ease and flexibility in field operations and in determining provincial averages. The total sample respondents for each province were further broken down into irrigated and rainfed ecosystems based on the proportion of irrigated and rainfed harvest areas to the provincial total harvest area. A minimum of 20 sample respondents per ecosystem for each province was set to ensure that enough data points can be used for data processing.

Step 2: Village Selection

Using the province as domain, all rice-producing villages in the selected provinces served as the sampling population. These villages are classified by personnel in the

the writing of this documentation. Nevertheless, this may not have a big effect on the representativeness of the sample at the national level since Pangasinan has a large physical area compared to other top-producing provinces and has, therefore, great potential in rice production.

BAS-Provincial Operation Center into irrigated and rainfed. Villages with source of irrigation water for more than 50% of their physical area for rice were categorized as irrigated, while the opposite was categorized as rainfed. Using simple random sampling, sample irrigated and rainfed villages were drawn accordingly from the lists.

Uniform sizes of sample villages across provinces in each stratum were set at 17, 13, 10, and 7, for the first, second, third, and fourth strata, respectively. The numbers of irrigated and rainfed villages corresponded to the proportion of irrigated and rainfed harvest areas to the provincial total harvest area. However, to ensure that each ecosystem was properly represented, at least two villages per ecosystem in each province were maintained. Each village had 8-10 sample respondents.

Step 3: Selection of Sample Respondents

For every sample village, rice-based sample households were selected using the right coverage approach. Starting from a pre-determined landmark within the village (i. e., village hall, elementary school, or church), an enumerator asked the members of the household living in the third house if they were farming rice. If yes, the enumerator would proceed with the interview of the respondent. If no, the enumerator would continue to visit every third house along the right path until he/she finds a suitable household to be interviewed. This process was done to randomize sample selection in the initial round of the RBFHS in the absence of a list of rice farmers in each village.

In the succeeding RBFHS round, the same respondents from the previous round were interviewed again. Rules on replacement were applied when a farmer-respondent is deceased, has migrated, or has permanently stopped rice farming. In these cases, the priority replacement would be the household member to whom the management of the rice farm was transferred. If the farm was subdivided into several household members, the enumerator would randomly select the household member to be interviewed. If the management of the farm was transferred to a non-household member within the village, then that person would be the priority replacement. Random selection would be applied again when there were multiple recipients of the rice farm. If the new farming household could not be identified, the right coverage approach would be re-employed.

If rice farming has stopped in the whole village either due to a peace-and-order situation or some adverse conditions such as flash-flooding or landslides, the nearest village that had the same conditions as the one being replaced would be selected. The enumerator would randomly select if there are multiple potential replacements for the village. In this case, the right coverage approach would be utilized once more to determine the sample respondents in the replacement village.

THINNING THE SAMPLE: THE CASE OF THE 2006-2007 RBFHS ROUND

As mentioned earlier, the RBFHS sample size was reduced to 2,000 in the 2006-2007 survey round due to budget constraint. To downscale the sample, the panel respondents (1,898 samples) from the 1996-1997 and 2001-2002 survey rounds were

retained first. Since majority of the respondents were from irrigated villages, the remaining 102 respondents were chosen from the sample in rainfed villages. Provinces with significantly reduced sample size (if provincial panel respondents are few) were prioritized for the allocation of the remaining sample from rainfed areas. Table 2 shows the sample allocation in the 2006-2007 survey round and how it was compared to 2001-2002.

COMPLEMENTING THE RBFHS DATA

The RBFHS data focus on the rice production aspect at the farm level. As such, other aspects of the rice industry particularly those in processing and marketing were not available from the RBFHS data. In this book, various chapters complemented the RBFHS data with data from other sources. Data on sensory evaluation of different rice varieties from the Rice Chemistry and Food Science Division of PhilRice was used in assessing grain quality. Data on grain quality from the breeding perspective was also utilized. The chapter discussing supply chain employed survey data to construct a cost structure for rice processing and marketing. This complementation has further enriched our understanding of the rice industry and the breadth of the policy recommendations generated by each chapter.

CONCLUSION AND IMPLICATION

The data generation process of the RBFHS is not perfect, but is continuously evolving to make data collection more accurate and responsive to the needs of the policymakers. While data collection is costly, the RBFHS must be continued to ensure the availability of information, which are key inputs to policy analysis.

Nevertheless, continuous improvement is needed in implementing the future rounds of the RBFHS. One direction that can be explored is the use of information and communications technology to conduct a paperless survey. This can potentially minimize the cost and error, as data encoding can be done almost simultaneously as data collection. Proper process documentation is also needed to ensure that tacit knowledge is passed from one generation of project implementers to another.

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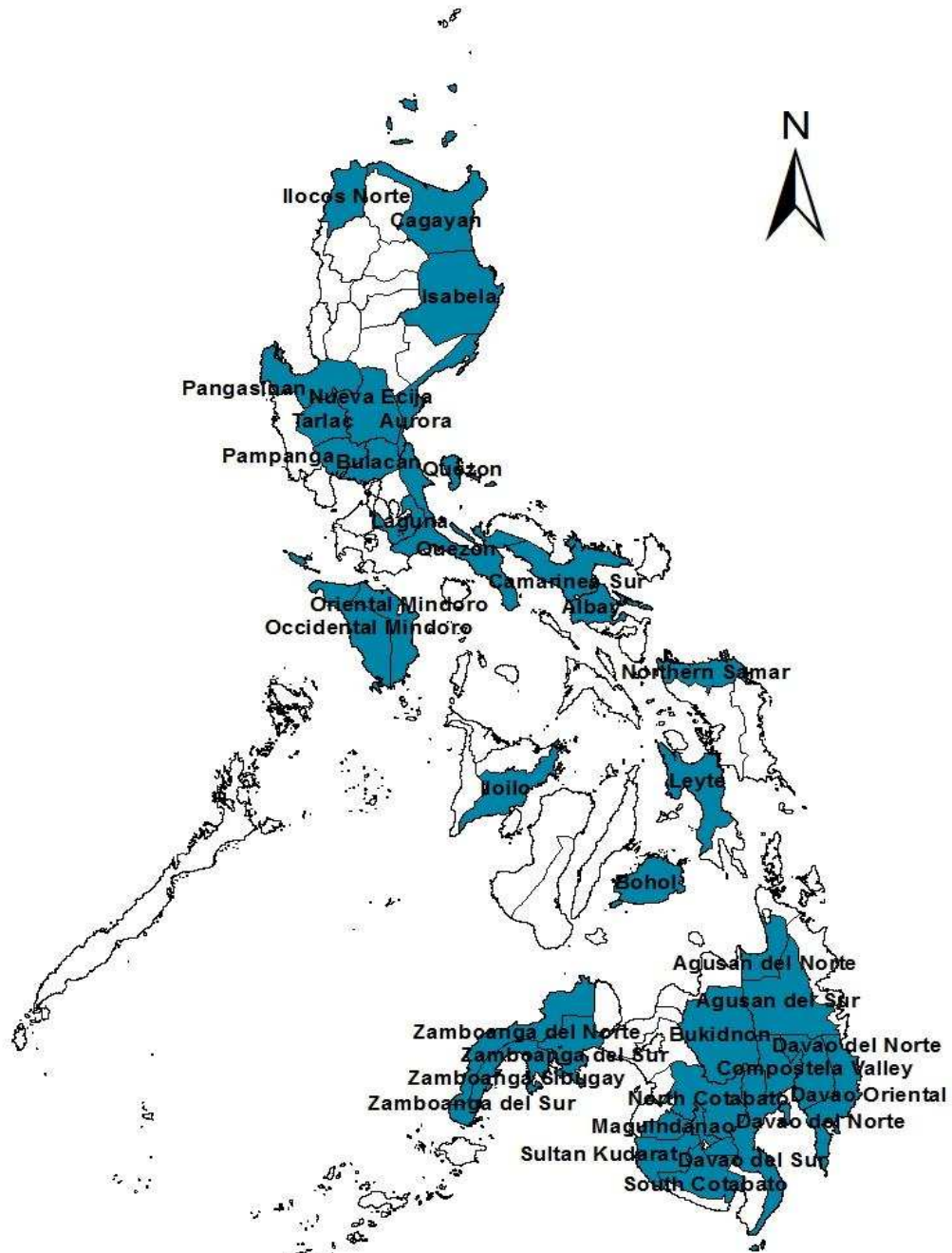


Figure 1. Provinces covered in the Rice-Based Farm Household Survey (RBFHS).

Table 1. Sample allocation for the Rice-Based Farm Household Survey (RBFHS).

REG	PROVINCE	PROVINCIAL RANK	5-YEAR AVERAGE HARVEST AREA (1992-1996)			SHARE TO TOTAL	CUMULATIVE RATIO	STRATA	SAMPLE SIZE (HOUSEHOLDS)			SAMPLE SIZE (BARANGAYS)		
			IRRIGATED	RAINFED	TOTAL				IRRIGATED	RAINFED	TOTAL	IRRIGATED	RAINFED	TOTAL
I	Pangasinan	1	344710	244416	589126	0.204	0.204	1	91	64	155	10	7	17
III	Nueva Ecija	2	194545	52950	247495	0.086	0.290	1	122	33	155	13	4	17
VI	Iloilo	3	92612	113713	206325	0.071	0.361	2	54	66	120	6	7	13
II	Isabela	4	184842	16912	201754	0.070	0.431	2	100	20	120	11	2	13
V	Camarines Sur	5	72018	40888	112906	0.039	0.470	2	77	43	120	8	5	13
II	Cagayan	6	77499	30835	108334	0.038	0.508	2	86	34	120	9	4	13
III	Tarlac	7	60129	34519	94648	0.033	0.541	3	57	33	90	6	4	10
XII	North Cotobato	8	53814	30752	84566	0.029	0.570	3	57	33	90	6	4	10
ARMM	Maguindanao	9	25246	59283	84529	0.029	0.599	3	27	63	90	3	7	10
VIII	Leyte	10	57206	27260	84466	0.029	0.628	3	61	29	90	7	3	10
IX	Zamboanga del Sur	11	44555	35176	79731	0.028	0.656	3	50	40	90	6	4	10
III	Bulacan	12	22975	55592	78567	0.027	0.683	3	26	64	90	3	7	10
IV-B	Oriental Mindoro	13	53737	24128	77865	0.027	0.710	3	62	28	90	7	3	10
VII	Bohol	14	16226	60288	76514	0.027	0.737	3	20	70	90	2	8	10
X	Bukidnon	15	64868	10431	75299	0.026	0.763	3	70	20	90	8	2	10
XII	Sultan Kudarat	16	54322	19875	74197	0.026	0.789	4	40	20	60	5	2	7
IV-B	Occidental Mindoro	17	37283	30023	67306	0.023	0.812	4	33	27	60	4	3	7
IV-A	Quezon	18	32784	33331	66115	0.023	0.835	4	30	30	60	3	4	7
V	Albay	19	53673	8834	62507	0.022	0.856	4	40	20	60	5	2	7
XII	South Cotobato	20	48052	13898	61950	0.021	0.878	4	40	20	60	5	2	7
III	Pampanga	21	50362	4093	54455	0.019	0.897	4	40	20	60	5	2	7
XI	Davao del Norte	22	48236	4651	52887	0.018	0.915	4	40	20	60	5	2	7
I	Ilocos Norte	23	36676	10972	47648	0.017	0.932	4	40	20	60	5	2	7
VIII	Northern Samar	24	3173	37063	40236	0.014	0.946	4	20	40	60	2	5	7
Caraga	Agusan Sur	25	14982	17625	32607	0.011	0.957	4	28	32	60	3	4	7
IV-A	Laguna	26	29075	1811	30886	0.011	0.968	4	40	20	60	5	2	7
IX	Zamboanga del Norte	27	9862	17069	26931	0.009	0.977	4	22	38	60	3	4	7
XI	Davao del Sur	28	23396	1573	24969	0.009	0.985	4	40	20	60	5	2	7
Caraga	Agusan del Norte	29	12841	9718	22559	0.008	0.993	4	34	26	60	4	3	7
III	Aurora	30	16918	2387	19305	0.007	1.000	4	40	20	60	5	2	7
TOTAL			1836617	1050066	2886683	1.000			1487	1013	2500	169	112	281

Table 2. Sample size distribution per province, 2001-2002 and 2006-2007 RBFHS rounds.

PROVINCE	2001-2002 RBFHS ROUND			2006-2007 RBFHS ROUNDS		
	Irrigated	Non-irrigated	Total	Irrigated	Non-irrigated	Total
Agusan del Norte	34	26	60	14	11	25
Agusan del Sur	29	31	60	23	18	41
Albay	40	20	60	29	20	49
Aurora	40	20	60	45	12	57
Bohol	20	70	90	21	54	75
Bukidnon	79	20	99	32	16	48
Bulacan	18	64	82	27	50	77
Cagayan	86	34	120	86	28	114
Camarines Sur	71	43	114	59	31	90
Compostela Valley	16	10	26	12	0	12
Davao del Norte	24	10	34	19	0	19
Davao Oriental	40	20	60	56	4	60
Davao del Sur	60	0	60	32	0	32
Ilocos Norte	32	20	52	35	22	57
Iloilo	54	66	120	38	50	88
Isabela	100	27	126	76	13	89
Laguna	40	32	72	37	19	56
Leyte	72	27	99	59	20	79
Maguindanao	63	27	90	28	18	46
North Cotabato	57	33	90	28	13	41
Northern Samar	20	52	72	21	29	50
Nueva Ecija	121	33	155	91	19	110
Occidental Mindoro	33	27	60	24	27	51
Oriental Mindoro	71	28	99	59	26	85
Pampanga	30	20	50	45	11	56
Pangasinan	91	64	155	103	44	147
Quezon	30	30	60	30	22	52
South Cotabato	40	20	60	39	10	49
Sultan Kudarat	40	20	60	39	14	53
Tarlac	57	33	90	57	19	76
Zamboanga del Norte	22	38	60	17	25	42
Zamboanga Sibugay	8	20	28	3	19	22
Zamboanga del Sur	42	20	62	40	11	51
TOTAL	1580	1005	2585	1324	675	1999*

*One of the survey returns was missing, which further reduced the 2006-2007 sample size into 1,999