THE OPERATIONAL ASPECTS OF THE FARM RECORD KEEPING PROJECT

by

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INTRODUCTION

In recent years, increasing interest in the potential ability of the farmers to recall important farm-level information during farm surveys have been expressed by economists, sociologists and other physical scientists. Memory recall is a significant factor in determining the magnitude of measurement errors. Collinson (1) and Lipton, et. al. (6) have devised a useful framework to analyze such relationship. This is briefly shown in Figure 1.

Time Dimension	Impression Type	
	Registered	Unregistered
Single	No significant memory bias	"Moderate" memory bias
Continuous	"Moderate" memory bias	Significant memory bias

Figure 1. Relationship of the Time and Impression Factors to Survey Memory Biases

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The time dimension pertains to the period's length (or "roughly" frequency) of the measurable farm activity of interest to the researcher. Impression type as defined by Norman (7) "refers to the extent to which circumstances influence the respondent's ability to remember the quantities of an activity". An example of a single and unregistered event will be the purchase of a piece of chewing tobacco by a farmer on his way to the field whereas a classic illustration of the continuous and unregistered process is the daily consumption of rice and vegetables within the farm household. We will note that each data cell on Figure 1 will require a different sampling size, frequency of contact with the respondent, and degree of participation in the interviewing process by the respondent. To illustrate, data elements belonging to the continuous and unregistered block require a high frequency of contact with the latter, a small sample size (which no doubt increases the magnitude of sampling errors) and either no participation on the part of the farmer (in which case direct measurement of the relevant farm variables will be undertaken by the researcher) or active participation by the farmer (in the form of his actual recording of the information needed by the research group). Hence, assuming the absence of severe administrative problems (pertinent to the sample size), *the basic rationale for the pursuance of a Farm Record Keeping Project (FRKP) is the minimization of measurement errors (caused by memory recall problems) arising particularly from unregistered and continuous farm data.*

However, an FRKP requires considerable research resources. For example, in the case of the FRKP project of the International Rice Research Institute (IRRI), Department of Agricultural Economics, the cooperators' records were checked regularly twice in a week (Tuesday and Friday). In addition, the record books were distributed and collected weekly every Friday. Also, due to the tendency of the respondent's data file to increase at significant rate (as more information is required by the research effort), the existence of an efficient and reliable data-processing system is indispensable. An example of the daily information recorded by a cooperator in an FRKP is given on Table 1. The diversity of the commodity units requires considerable thought on the part of the FRKP researcher with regards to the method of aggregation which will make economic sense and which will facilitate computer editing and formatting processes. It is also implicit from Table 1 that in an FRKP decisions on the "microness" of the data have to be made by the

researcher. The greater the demand for a detailed unregistered (continuous or single) data set, the larger will be the recording time spent by the cooperators (whose implict costs of time inputs are generally high during the peak farm activity) and by the survey staff and the smaller will be the sample size.

Due to the magnitude of the administrative task, the sample size of an FRKP is usually small. For example, in the case of IRRI: *"From the total 95 households in the village, twelve cooperators were selected for the record-keeping project. The selection of the cooperators was not random, but based on our judgment on the ability and the willingness to participate in the project"*   (Hayami, et al. (4)).

It is, therefore, the task of this paper to discuss our operational experience with the FRKP (started in 1976) currently being undertaken by the Bureau of Agricultural Economics (BAEcon). To make the research topic manageable, discussion shall be limited to our Iloilo cooperators which account for about a third of the total number of respondents.

Brief Background of the BAECON Farm Record Keeping Project

The main objectives of the BAECon project are:

(i)   To teach farmers how to keep account of all activities which may render valuable basis in making future decisions for increased farm productivity, income and efficiency in the use of available resources.

(ii)   To obtain reliable farming and household data useful to agricultural development planning through a systematic method of recording farm and household information or transactions.

(iii) To compare the performance of selected farm types using farm business analysis techniques.

(iv)   To test the effectiveness of the said record book in an attempt to develop a standard set of forms for use in the Philippines.

The information recorded by the farming and non-farming cooperators in a prescribed data input form can be classified into the following:

(i)   Farm Labor

(ii)   Farm Expenses

(iii)   Farm Incomes

(iv)   Household Expenses (classified as to purpose)

(v)   Household Incomes (all sources)

The cooperators are assisted by emergency statistical aides (ESA) who are paid an average of ₱485 per month. Each statistical aide supervises about twenty cooperators.

Stratification Method

The study originally included ten provinces which were designated as the National Food and Agricultural Council (NFAC) priority areas of operation. Within each province, a two-stage sampling scheme was employed using the Barrio High School (BHS) as the primary sampling unit (psu) and the farm household as the secondary sampling unit (ssu).

All BHS in each province were listed in descending order based on the size of the third-year enrollment. The BHS comprising the upper 50 percent of the third year student population were designated as the selected psu. In each of the latter, third-year students were asked to bring home a Household Information Sheet (HIS) to be filled up with the assistance of household heads. The HIS was used to stratify the household heads into two, i.e.:

(i) Farming households (those raising at least .1 hectare cropland, 20 heads livestock and/or 100 poultry birds.

(ii) Non-farming households

Farming household were further sub-stratified according to:

(a) Masagana 99 participant (defined as those who received credit assistance under the program in 1975 or who have obtained a production loan under the said program prior to 1975 but still have outstanding debts).

(b) Non-Masagana participants.

Within the non-farming households, sub-stratification were based on the nature of the salary earned by the respondent in 1975, i.e. monthly, daily and seasonal. In cases where the respondent have shifted from monthly to daily (or other possible job type combinations), the length of employment determined his status. In cases of equal job period lengths, his job in the last six (6) month period defined the respondent's sub-strata.

Furthermore, for Masagana 99 and Non-Masagana participants, systematic sampling with a random start was employed. Sampling

fractions for Masagana 99 and Non-Masagana participants are 1/10 and 1/20, respectively with a minimum of two samples per stratum.

The BAEcon Iloilo FRKP

The number and location of the Iloilo cooperators are given on Table 2. At the time that we were listing the addresses of our cooperators, one of the emergency statistical aides resigned without formally turning over the pertinent "addresses" of 20 cooperators (under his supervision) which were located generally at Dingle.

In October 1978, in line with the objective of improving the field operational level of the Iloilo FRKP a research team[1] from the Economic Research Division (ECRES) of the BAEcon was dispatched to Iloilo to conduct an evaluation of the Iloilo FRKP cooperators based from the following major operational criteria:

(i) Accessibility of respondent

(ii) Degree of the respondent's cooperation (as indirectly measured by his non-response rate) in accomplishing daily the FRKP forms.

Iloilo FRKP Management Evaluation Results

The detailed locational traits of the cooperators which was developed by the ECRES learn together with the ESAS are given on Table 3 and 4. The base used in computing the distances and time involved in reaching the respondent was the Iloilo BAEcon field office. *As shown in Table 3, the effective traveling time from the BAEcon office to the town proper where the respondents are situated ranges from 18 minutes to 3 hours.*

The location of the respondent becomes a more severe operational constraint as one examines Table 4. For example, for the ESA to reach our cooperator in San Rafael, he has to physically hike 9 kilometer distance. To make things worse, the frequency of public utility jeep trips from the BAEcon office to San Rafael is very low and the probability of finding the cooperator in his residence is unknown and is nil particularly during the peak of his work activity.

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1. There were 9 members of the team. One of the team members hailed from Iloilo and was quite familiar with the provincial terrain.

The degree of the Iloilo respondent's cooperation with regards to the filling up of the daily records (which was "measured" by the ECRES team through direct interviews with the farmers and through examination of the content quality of his records) is given on Table 5. Thirty-two percent of those willing to withdraw from the recording process cited boredom as their main reason for potentially terminating their participation.

An inquiry was also conducted by the ECRES team regarding recording problems arising from the current structure of the data input form. As shown in Table 7, sixty-six percent of the total Iloilo FRKP participants have difficulties in accomplishing the form. Forty-three percent of those with problem (Table 8) gave lack of time and language barriers as the specific reasons for their recording woes.

Possible Means to Improve the Data Collection Aspects of the Iloilo Farm Record Keeping Project (FRKP)

The first component of the FRKP which can be modified pertains to the sample size. As shown on Tables 9 and 10, the field ESAS have recommended the total deletion of 28 samples out of the 134 respondents interviewed by the ECRES team. Such number may even be increased to 48. Subjective evaluation by the author of the remaining 20 respondents not covered by the ECRES team showed that it is physically difficult on the part of the ESA to reach the former.[2]

Furthermore, to eliminate boredom on the part of the participants and to provide some insights into the magnitude of the sample estimates' changes between years, the remaining respondents which will be retained can be subjected to a rotation sampling scheme (Eckler 3). Rotation sampling[3] basically involves subdividing the sample into i distinct groups and then arranging the latter into rotation groups. Only the ith group will be undergoing the recording process in the kth year.

Furthermore, rotation sampling provides an opportunity for improving the efficiency of the FRKP as long as "the consecutive

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2. Some of the respondents have roaming fierce dogs which "adds" some excitement to the record-keeping process.

3. Minimum variance estimates from rotatin sampling is restricted to the class of linear unbiased estimates.

measures of a characteristic for the same sampling unit is high" (David 2) and positive. This is implied[4] in the relation (in the case of a one-level rotation):

(1) Variance of the minimum variance estimates = Var (M')

$$= \frac{2 \sigma^2 A}{n}$$

where $A = p^2 - 1 + \sqrt{1-p^2}$ (p being the correlation coefficient of the ith sample pair

An alternative strategy to stimulate the farmer's interest in the recording activity is to grant them some incentives like t-shirts (which was undertaken in the past). This, however, might increase the sources of survey difficulties. Kearl 5 and Tollens 8 pointed out that the granting incentives to individual farmer participants might create tensions with farmers not included in the FRKP and might build up expectations. Nevertheless, some rewarding system, in the case of Iloilo FRKP to compensate efficient and diligent cooperators, has to be formulated.

Finally, translation of the data input form into the Ilongo dialect is a "must" especially if the farmer has no assistance whatsoever from an educated household member. Although the present record keeping form is bi-lingual (in English and Pilipino), it is still likely difficult to complete it in areas where the literacy rate is minimal.

4.
$$\frac{dA}{dp} = \frac{1}{p}\left[\frac{2(1-p^2)1/2-1}{(1-p^2)\,1/2}\right] + \left[\frac{-2A}{p^3}\right] \leqslant 0$$

SUMMARY

The research reported in this paper summarizes our field experiences with the data collection of the BAEcon Iloilo Farm Record Keeping Project (which was undertaken to minimize measurement errors arising from memory biases in farm-level surveys). It has been shown that the degree of cooperation and the accessibility of the FRKP participants are binding constraints in the efficiency of the recording process. The constraints, however, can be "loosened up" through rotation sampling, a smaller sample size, and simplification of the data input form.

TABLE 1
SAMPLE FARM RECORD KEEPING INFORMATION AT IRRI

PANGARAW-ARAW NA TALAAN NG KITA AT GASTOS

Petsa: _____ Araw: _____

Pangalan ng Ama: _____

Pangalan ng Ina: _____

Paliwanag	Bagay na Bigay	Pinagkakitaan Dami	Pinagkakitaan Halaga	Bagay na Ani	Ginastos Dami	Ginastos Halaga
Nagbili ng 10 cav. palay		400 kg.	₱400.00			
Nagbili ng 1 baboy		80 kg.	584.00			
Interest sa utang sa Banko						₱50.00
Nagpagupit						1.50
Pasahe						2.00
Bumili ng: Asin					1	1.00
Tela					1	20.00
Isda					1 kg.	7.00
Gasolina					1 litro	1.75
Nagsaing 3x				1 salop		(4.50)
Itlog				2		(1.00)
Talbos ng kamote				1 kimis		(0.10)
Nagbayad sa trabaho	2 tao			2 salop		(9.00)
Niyog-hingi	2		(0.30)			
Nagregalo ng bigas				2 salop	(9.00)	(9.00)
Pera bigay ng anak			100.00			
Umutang sa tindahan			2.00			
Langis					1 bote	1.50
Tinapay						.50
Nagbayad ng utang						2.00
Baon ng anak						1.00
Suweldo ng operator					2	14.00
Kita sa tanim		2	14.00			

TABLE 2
NUMBER AND LOCATION OF 134 COOPERATORS,
FRK PROJECT, ILOILO, 1978

Location	Number	Location	Number	Location	Number
DINGLE	79	TAPAZ CAPIZ	3	GUIMBAL	3
Calicuang	14	San Miguel	2	Camangahan	2
San Jose	11	Ambolong	1	Binawaan	2
Dawis	10	OTON	4	MIAG-AO	9
Siniba-an	9	Sambaludan	2	Palaca	2
San Matias	6	Batong	2	Buenavista	2
Buenavista	6			Bolocaue	2
Libo-o	6	BADIANGAN	1		
Licu-an	4	Ilong Bukid	1	Damilisan	1
Camambugan	4	DUEÑAS	4	Aquiawan	1
Tahugon	4	Bugtungan	2	Banbanan	1
Namatay	3	Fundacion	1	SAN JOAQUIN	5
Matangharon	1	Catig	1	Lawigan	3
Hinalinan	1	LAMBUNAO	1	Sinogbuhan	1
				Iggores	1
NEW LUCENA	6	Binabaan	1	DUMANGAS	3
Cabilauan	2	ZARRAGA	2	Lublub	1
Baclayan	1	Jalaud	2	Tamboilan	1
Dawis	1				
Bolalacao	1	TIGBAUAN	4	Rosario	1
Guinobatan	1	Binaliuan	2	POTOTAN	6
		San Rafael	2	Pitogo	2
AJUY	1	LEON	2	Naslo	1
Sto. Rosario	1	Baga	1	Danao	1
CALINOG	1	Tina-an	1	Palanguia	1
Malitbog	1			Dongsol	1

TOTAL 134*

*20 Cooperators not included

TABLE 3
DISTANCE, TIME, MEANS OF TRANSPORTATION, FREQUENCY
AND FARE FROM THE FIELD OFFICE TO TOWN PROPER,
134 COOPERATORS, FRK PROJECT, ILOILO, 1978

Location (Towns)	Distance (kms.)	Time (hrs.)	Means of Transportation	Frequency	Fare (One Way)
New Lucena	28	1.5	Jeep	Every 45 minutes	₱1.75
Ajuy	78	3.0	Jeep	Every hour	5.30
Tapaz	68	3.0	Bus/Jeep	Every hour	4.50
Calinog	65	3.0	Bus	Every hour	4.50
Oton	11	.3	Jeep	Regular	1.00
Miag-ao	40	1.5	Jeep/Mini-Bus	Regular	2.00
San Joaquin	33	2.5	Jeep	Rare	4.00
Dumangas	49	1.5	Jeep	Every hour	2.00
Pototan	45	1.5	Jeep	Every 30-45 min.	2.20
Dueñas	45	1.5	Jeep	Every 30-45 min.	2.00
Dingle	42	1.5	Jeep	Every 30-45 min.	2.50
Zarraga	19	.6	Jeep	Every 30-45 min.	1.25
Tigbauan	22	.5	Jeep	Rare	1.45
Leon	27	1.0	Jeep	Every 2 hours	1.80
Guimbal	28	1.0	Jeep	3 times a day up to 2 p.m.	1.80

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TABLE 4

DISTANCE, TIME, MEANS OF TRANSPORTATION, FREQUENCY
AND FARE FROM TOWN PROPER TO FARMER'S RESIDENCE,
134 COOPERATORS, FRK PROJECT, ILOILO, 1978

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Location By Barrio	Distance (kms.)	Time* (hrs.)	Means of Transportation	Frequency	Fare (One Way)
DINGLE					
San Jose	1.5 + 2 kms. walk	3-15 min.	Tricycle	Regular	₱ .50
Calicuang	5.0	15-30 min.	Tricycle/walk	Regular	1.25
Siniba-an	4.0 + 1 km. walk	15 min.	Tricycle/walk	Regular	.75
Licuan	7.0	15-30 min.	Tricycle	Regular	.50
Camambugan	8.0	30 min.	Tricycle	Regular	.50
San Matias	1.0	15 min.	Walking Distance	—	—
Tabugon	5.0	1 hr. & 10 min.	Tricycle	Regular	1.00
Buenavista	5.0 + 2.5 kms. walk	1 hr. & 10 min.	Tricycle/walk	Regular	1.00
Libo-o	4.5 + 2.5 kms. walk	1 hr. & 8 min.	Tricycle	Regular	1.00
Dawia	1.5	5 min.	Tricycle	Regular	.50
Namatay	9.0 + 3.0 kms. walk	1.5 hours	Tricycle	Regular	1.50
Natangharon	5.0 + 5.0 kms. walk	3 hours	Tricycle/boat/walk	Regular	1.50
Hinalinan	2.5 + 3.0 kms. walk	35 min.	Tricycle	Every 20-25 min.	1.25
NEW LUCENA					
Cabilauan	8.0 + 1.5 kms. walk	15 min.	Jeep	Every 45 min.	.50

TABLE 4 – Continued

Location By Barrio	Distance (kms.)	Time* (hrs.)	Means of Transportation	Frequency	Fare (One way)
Baclayan	5.0	12 min.	Jeep	Every 45 min.	.50
Dawis	4.0	30 min.	Tricycle	Every 45 min.	.30
Bolalacao	3.5	25 min.	Tricycle	Very seldom	2.00 (hired)
Guinobatan	3.0	25 min.	Jeep	Rare	2.00 (hired)
AJUY					
Sto. Rosario	15.0	30 min.	Jeep	Irregular	1.00
TAPAZ CAPIZ					
San Miguel	7.0 + 2.5 kms. walk	15 min.	Jeep	No definite interval	.50
Ambulong	8.0	10 min.	Jeep	No definite interval	.50
CALINOG					—
Malitbog	5.0	10 min.	Jeep	Irregular schedule	₱ .40
OTON					
Sambaludan	7.0 + 1.0 kms. walk	30 min.	Jeep	Only 4 Jeeps operating	.50
Botong	5.0 + .7 kms. walk	15 min.	Jeep	Continuous	.50

Location By Barrio	Distance (kms.)	Time* (hrs.)	Means of Transportation	Frequency	Fare (One way)
MIAG-AO					
Damilisan	9.0	20 min.	Jeep/Mini-bus	Every hour	.50
Palaca	6.5 at 1.5 kms. walk	15 min.	Jeep/Mini-bus	Every .5-1 hr.	.30
Buenavista	3.0 kms. walk	45 min.	Jeep/Mini-bus	Inaccessible	
Aguiawan	5.0	15 min.	Jeep	Every hour	.30
Banbanan	5.0 + 2.0 kms. walk	15 min.	Jeep	Every .5-1 hr.	.30
Balacaue	5.0 + 2.3 kms. walk	15 min.	Jeep	Every .5-1 hr.	.30
SAN JOAQUIN					
Lawigan	19 + 30 meters walk	30 min.	Jeep	Jeeps are few	(Straight from city barrio)
Sinogbulan	19 + 1.5 kms. walk	30 min.	Jeep	Jeeps are few	— do —
Igcores	19 + 3.0 kms. walk	30 min.	Jeep	Jeeps are few	— do —
DUMANGAS					
Lublub	1.0	10 min.	Tricycle	Every 25-30 min.	.30
Tamboilan	1.0 + 2.0 kms. walk	10 min.	Tricycle	Every 25-30 min.	.30
Rosario	3.0	30 min.	Tricycle	Every 25-30 min.	1.00
POTOTAN					
Naslo	2.0	20 min.	Tricycle	Every 20-25 min.	.60

Table 4 (Continued)

Location By Barrio	Distance (kms.)	Time* (hrs.)	Means of Transportation	Frequency	(One way)
Danao	3.0 + 0.3 kms. walk	30 min.	Tricycle	Every 20-25 min.	.75
Pitogo	4.0 + 0.3 kms. walk	40 min.	Tricycle	Every 20-25 min.	1.25
Palanguila	2.0 + 0.3 kms. walk	40 min.	Tricycle	Every 20-25 min.	1.25
Daongsol	4 + 100 meters walk	40 min.	Tricycle	Rare	.50
BADIANGAN					
Ilong Bukid	15 + 0.5 kms. walk	30 min.	Jeep	2x a day but during market day 4x Tues. Friday	₱1.50
DUEÑAS					
Bugtungan	15 + 2.0 kms. walk	30 min.	Jeep	2x a day but during market day 4x Tues. Friday	1.50
Fundacion	15 + 8.0 kms. walk	30 min.	Jeep	Rare	2.00
Calig	15 + 3.5 kms. walk	30 min.	Jeep	Rare	2.00
LAMBUNAO					
Binabaan	15 + 1.5 kms. walk	35 min.	Jeep	2x a day but during market day — 4x	2.00

Table 4 (Continued)

Location By Barrio	Distance (kms.)	Time* (hrs.)	Means of Transportation	Frequency	Fare (One way)
ZARRAGA					
Jalaud	1.0 kms. walk	—	—	Near the road straight fare from city to barrio	
TIGBAUAN					
Binaliwan	8.0 kms. walk	30 min.	Jeep/Tricycle	Rare	.50
San Rafael	5 + 9.0 kms. walk	35 min.	Jeep	Rare	.60
LEON					
Buga	3.0	30 min.	Jeep	Rare	.30
Tina-an	6 + 1.0 kms. walk	40 min.	Jeep	2x a day	.60
GUIMBAL					
Camangahan	5.0	35 min.	Jeep	Rare	.50
Binanwaan	6 + 4.0 kms. walk	40 min.	Jeep	Rare	.60

TABLE 5
DEGREE OF COOPERATION, 134 COOPERATORS,
FARM RECORD KEEPING PROJECT, ILOILO, 1978·

Degree	Number Reporting	Percent
Very cooperative or very willing to continue	54	40
Moderately cooperative or willing to continue	58	43
Uncooperative with some not willing to continue	22	17
TOTAL	134	100

TABLE 6
REASONS FOR NON-COOPERATION, 22 COOPERATORS,
FARM RECORD KEEPING PROJECT, ILOILO, 1978

Reason	Number Reporting	Percent
Bored in recording	7	32
Busy with farm work	5	23
Son/niece doing the record-ing now studying	3	13
Always out of the barrio	2	9
Others[1]	5	23
TOTAL	22	100.

[1]Includes:
[a]Widow busy attending children
[b]Not interested because don't know how to record
[c]Reluctant in giving his view
[d]Daughter doing the recording is very busy with teaching job
[e]Land is idle and it's under investigation

TABLE 7
DO YOU HAVE ANY PROBLEM ENCOUNTERED REGARDING RECORDING?
134 COOPERATORS FRK PROJECT, ILOILO, 1978

Answer	Number Reporting	Percent
No problem	43	32
With problem	88	66
Not available	4*	2
TOTAL	134	100

*2 were out of the barrio during the interview and 1 died last October.

TABLE 8

PROBLEMS ENCOUNTERED BY 88 COOPERATORS,
FRK PROJECT, ILOILO, 1978

Problems	Number Reporting	Percent
1. Busy, have no time to record	30	31
2. Not recording and has to be interviewed by ESA	16	17
3. Difficulty in Understanding English instruction, wanted to translate in Ilonggo	12	12
4. Simplification of terms	8	8
5. Son/daughter/niece doing the recording are now studying	7	7
6. Forget to record but can update the data	6	6
7. Difficulty in accomplishing the record book	6	6
8. Forms not adequate	2	2
9. Not too interested anymore	2	2
10. Bored of recording	2	2
11. Others[1]	7	7
TOTAL	98*	100

[1]Includes:

a) Can not catch up with recording because too many government agencies are conducting the same interview.
b) Wanted that recording be done monthly.
c) Daughter doing the recording is busy with her teaching job.
d) Only 3 times visited by ESA due to location constraint since January 1978 – don't know where to put the data.
e) Two times visited by ESA due to location constraint in one year – don't know where to put the data.
f) Sometimes out of the barrio and not available to do the recording.
g) Always in Iloilo City and have no time to record.

TABLE 9
FIELD ESA'S RECOMMENDATION FOR 134 COOPERATORS,
FARM RECORD KEEPING PROJECT, ILOILO, 1978

Recommendation	Number Reporting	Percent
Retain	106	79
Cancel	28	21
TOTAL	134	100

TABLE 10
REASON FOR ESA'S RECOMMENDATION FOR CANCELLATION
OF 28 COOPERATORS, FARM RECORD KEEPING PROJECT, ILOILO, 1978

Reason	Number Reporting	Percent
Uncooperative	22	78
Moderately cooperative but place is risky during rainy season because of creek overflows	3	11
Very cooperative but distance too far and no means of transportation beside the only cooperator in the area	2	7
Moderately cooperative but upset with passing of wife	1	4
TOTAL	28	100

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