EVALUATION OF THE BUREAU OF AGRICULTURAL ECONOMICS RICE CROP FORECAST IN THE RURAL DEVELOPMENT PROCESS: THE PHILIPPINE EXPERIENCE

By

Gil R. Rodriguez, Jr., Clemencia C. Huelgas and Mamerto D. Damasco*

Introduction

In developing economies, the agricultural sector has always been the concern of policy makers. A number of factors can explain the situation. They are:

(1) The sector provides an average of about 50 per cent of the commodity export receipts.
(2) It employs close to two-thirds of the population.
(3) The income of the rural populace is usually low because of the inadequate human capital.

It is not surprising that rural development has been the primary agenda in any agricultural research package.

One of the essential ingredients for a sustained rural development process is a statistically acceptable set of information inputs. The latter is necessary for the efficient economic planning of the economy's private and public sectors.

Among the data elements in developing economies, statistics on rice production have always been in demand because rice is a political economic commodity. Hence, traders, economists, statisticians, sociologists, consumers and policy makers are continually applying pressure to improve the precision of rice crop estimates. The Philippines is not an exemption to this phenomenon. This paper aims to evaluate the accuracy of rice crop estimates in the Philippines made by the Bureau of Agricultural Economics (BAEcon) through randomly stratified agricultural surveys.

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*Officer-In-Charge, Economic Research Division; Senior Economist, Integrated Agricultural Production and Marketing Project; and Acting Assistant Director, Bureau of Agricultural Economics, respectively. The authors wish to acknowledge the insightful comments of Jerry Sharples, Rex Daly, Robert Herdt, Josefina Sison, and an anonymous referee for the earlier draft of this paper.

rief Institutional Background

The BAEcon works on a modest budget (in constant 1972 rices) allotted for rice and corn surveys as shown below:

Year	Budget (Million Pesos)[1]
1973	₱ 1.38
1974	1.00
1975	1.48
1976	1.35
1977	.99
1978	1.11

)espite this limitation, it has continually tried to improve the statis-ical precision of its rice production forecasts. Such efforts are partly eflected in the modified sampling design, e.g. updating of sampling rames to minimize sampling errors. On the other hand, BAEcon has lso adopted small-scale crop-cutting and farm record keeping stra-egies to analyze the feasible alternatives deemed to reduce non-ampling errors. To upgrade its technical capability, a number of ;AEcon personnel (approximately 20) have undergone training in omputer science and quantitative statistics at the masteral or octoral levels. However, due to the absence of corresponding adjust-ıents in the remuneration of qualified personnel, a high staff turn-ver has plagued the BAEcon. The turnover problem though has een minimized through stiff employment contracts.

Table 1 initially gives the quality of BAEcon's rice crop esti-ıates.[2] The degree of bias (determined by comparing the mean of he forecast against that of the actual estimate) is statistically insigni-icant.[3] As shown below, the probability of overestimating rice ields, area, and production tends to be high for both the first and econd crop forecasts in the national level within the crop years tudied:

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[1] The current exchange rate is ₱7.30 = $1

[2] The first rice crop forecasts are usually undertaken in the early part of ıe planting season, e.g. June for the wet season crop and January for the dry eason crop. The second crop estimates cover the latter part of the crop calen-ar, e.g. October or November for the wet season crop and April for the second eason crop.

[3] The null hypothesis that the mean sample estimate equals the actual ıean was not rejected in all cases at the 5 per cent level of significance.

	First Forecast		Second Forecast	
	Frequency of under-estimate (%)	Frequency of over-estimate (%)	Frequency of under-estimate (%)	Frequency of over-estimate (%)
Rice Production	12.5	87.5	12.5	87.5
Rice Yields	25	75	12.5	87.5
Rice Hectarage	25	75	25	75

This section presents the various indices used to evaluate the precision of BAEcon's crop forecasts. It should be noted that the acceptability of a forecast largely depends on the potential user's utility function. This is illustrated through the following simple model:

(1) $\hat{P}_t = a\hat{X}_{rt}$ (b < 0), the price equation

(2) $1(\hat{P}_t, \hat{X}_{rt}) = h[\ln(\hat{X}_{rt}/3)]^2 + k[\ln(\hat{P}_t/v)]^2$, the loss function (h, k > 0)

(3) $U[1(\hat{P}_t, \hat{X}_{r_t})] = U$, utility function of the user

where:

$\hat{P}_t$: is the retail price of rice in year t

$\hat{X}_{r_t}$: is the total rice output in year t

All logarithms are to the base e

3, v are the user's desired values for $\hat{P}_t$ and $\hat{X}_{r_t}$ respectively.

Obviously, $dU/dl(\hat{P}_t, \hat{X}_{r_t}(< 0$ and $1(\hat{P}_t, \hat{X}_{r_t}) = o$ when $\hat{X}_{r_t}/3)$ and $\hat{P}_t/v$ are equal to one. Hence, the immediate objective of the user is to minimize (2) which yields:

(4) $\ln(X^*_{r_t}/3) = (kb/h + kb^2\ (1nv - 1n\ a - b\ 1n3)^2$

U reaches its maximum value when:

(5) $1(X^*_{r_t}) = hk/h + kb^2\ (\ln v - \ln a - b\ \ln 3)^2$

For the purposes of this paper, the terms h and k were not ·termined. Also, the bulk of the analysis is centered on $\hat{X}_{rt}/3$. The ·sired value 3, is assumed to be equated with the actual rice pro- ·ction data. Hence, in terms of the function U, the closer $\hat{X}_{rt}$ to the "better-off" is the potential user. The correlation of $\hat{X}_{rt}$ with ·her variables like $\hat{P}_t$ will be discussed later.

The data base[4] enabled us to analyze the following aspects ·f the BAEcon's rice crop estimate as compared with the actual, ·e.:

(1) Absolute level errors
(2) Magnitude of change deviations
(3) Relative variable errors

·he index used to detect (i) is:

$$(6) \quad X_{rt} = a + b\,\hat{X}_{rt} + u$$

where :

X_{rt} : is the actual rice production in year t

u : a stochastic term with mean zero and constant variance

·ests of significance can be used to determine how close to zero and ·ne are the regression coefficients, a and b, respectively. If the null ·ypothesis of a = 0 and b = 1 is rejected, then the survey's estimated ·ice crop level shows some statistical errors. In its non-linear form, ·he previous equation is:

$$(7) \quad X_{r_t} = \propto \hat{X}^{c}_{r_t} \quad u$$

·n this case, the condition for a perfect absolute level forecast is ·hat $\propto$, c, u = 1.

To measure the magnitude of change deviations, Theil's (1966) ·nequality coefficients were used:

$$(8) \quad U^2 = \sum_i (P_i - A_i)^2 / \Sigma A_i^2$$

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4 The basic data used in our analysis can be provided upon request.

where P_i, A_i represents predicted and observed changes. According to Theil, (1966) "... by using the inequality coefficient, one measures the seriousness of a prediction error by the quadratic loss criterion in such a way that the zero corresponds with perfection and the unit with the loss associated with no-change extrapolation. It will be clear that the inequality coefficient has no finite upper bound, which is tantamount to saying that it is possible to do considerably worse than by extrapolating on no-change basis."

Also, the numerator in (8) can be decomposed as follows:

$$(9)\ R = 1/n \sum_i (P_i - A_i)^2 = (\overline{P} - \overline{A})^2 + (s_p - s_a)^2 + 2(1-r)$$

$$s_p s_a$$

where:

$$\overline{P} \quad : \quad 1/n \sum_i P_i$$

$$\overline{A} \quad : \quad 1/n \sum_i A_i$$

$$s_p^2 \quad : \quad 1/n \sum_i (P_i - \overline{P})^2$$

$$s_p^2 \quad : \quad 1/n \sum_i (A_i - \overline{A})^2$$

$$r \quad : \quad 1/n \sum_i (P_i - \overline{P})(A_i - \overline{A}) / s_p s_a$$

The terms at the right are the central tendency, unequal variation and incomplete covariation errors, respectively. Theil (1966) said that "incomplete covariance is more hopeless than errors in central tendency in the sense that we cannot expect that much can be done about it." Based on (9), r should be equal to 1 to get rid of the last term which is an impossibility. Furthermore (9) can be expressed as:

$$(9')\ 1 = (\overline{P} - \overline{A})^2 / R + (s_p - s_a)^2 / R + 2(1\text{-}r)\, s_p\, s_a / R$$

On the other hand, for purposes of evaluating the relative varia-
le errors, the information inaccuracy index was used:

$$10)\ I(X_{r_{t_k}}, \hat{X}_{r_{t_k}}) = \sum_k X'_{r_{t_k}} [h(X'_{r_{t_k}}) - h(\hat{X}_{r_{t_k}})]$$

where:

$X'_{r_{t_k}}$: $X_{r_{t_k}} / \sum_k X_{r_{t_k}}$

$X'_{r_{t_k}}$: $X_{r_{t_k}} / \sum_k X_{r_{t_k}}$

$h(X'_{r_{t_k}})$: $-\log(X'_{r_{t_k}})$

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ll logarithms are in terms of the base e. Equation (10) was original- / developed by Tilanus and Theil (1966) to evaluate the rela- ve magnitude estimation errors of the endogenous variables in an iput-output model. According to them, the rationale behind (10) is: . . . errors in less important variables are weighted less heavily than ie same relative errors in the more important one." An increasing or igh value of the information inaccuracy index (which does not have pper and lower bounds) indicates a decrease of the relative estima- ion capability of a given forecasting model.

mpirical Results

The regression model results patterned after equation (6) are gi- en on Tables 1 to 7. Separate regression equations (linear and log orm) were fitted to the palay production, area, and yield data for he crop years 1969-70 to 1977-78. The first set of equations tested ow well the rice crop estimates of BAEcon approximate the actual igures within the period of fit. The results at the national level are uite satisfactory. To illustrate, in the case of palay production, the imple correlation coefficient ranges from .88 to .94 (Table 2). How- ver, some modest degree of forecasting errors is reflected by the a| : 0 at the national and regional level equation.[5] This result is expec- ed because of:

[5] Majority of the equations indicate that the regression coefficients, bl, are ignificantly different from zero.

(a) Random weather variations.

(b) The BAEcon rice crop production estimates are really designed for making a forecast within a particular crop year (point estimate) and not within a time period.

Tables 2 to 4 indicate the importance of conducting second round surveys to correct any statistical biases encountered in the first. For example, the intercept, regression slope, and r of the national palay production equation (Table 2) significantly improved when the second forecast estimates were used as explanatory variables.[6] This hypothesis was analyzed by fitting cross-section regressions for each crop year. The results are given in Tables 5 to 7.

To illustrate the impact of weather and other environmental variations,[7] it is interesting to compare the following yield equations[8]:

Wet Season (Crop Year 1972/1973)

(1) $Y = 1073.52 + .19\ \hat{Y}_{11}$ $(.12)$ r = .47 (First Forecast)

(2) $Y = 940.24 + .28\ \hat{Y}_{12}$ $(.09)$ r = .71 (Second Forecast)

Dry Season (Crop Year 1972/1973)

(1) $Y = -304.70 + 1.08\ \hat{Y}_{21}$ $(.19)$ r = .88 (First Forecast)

(2) $Y = 470.63 + .71\ \hat{Y}_{22}$ $(.21)$ r = .75 (Second Forecast

[6] The regression coefficient (in the linear form) increased from .76 to .94; the r from .87 to .94; and the intercept decreased from 1119.88 to 121.92 (thousand metric tons).

[7] It is well-known that in the Philippines weather variations are greater in the wet season (June-December) than in the dry season (January to June).

[8] Variables with "^" refer to forecasted values.

may be noted that the absolute magnitude errors seem to be lower n the dry season estimates than those of the wet season because the ntercepts and regression coefficients of the second set of equations re much closer to zero and one, respectively. The simple correlation coefficients are also higher in the dry season equations.

On the other hand, the good fit obtained in the cross-section equations (Tables 5 to 7) shows the precision of BAEcon rice production forecasts in predicting actual point magnitudes. The average simple correlation coefficient, regression coefficient, and intercept in the production equations (Table 5) are .96, .93; and 12 (thousand metric tons) respectively. Furthermore, to analyze the deterioration rate for purposes of making magnitude point prediction of a given sample forecast generated for a given crop year, the following regression relationships were estimated:

(11) $X_{r_t} + 1 = a + b X_{r_t}$ (t = 1969, 1970, . . . 1977)

The results are given in matrix form in Table 8. It is a remarkable finding that even after a lag of two to three years, a previous sample estimate can be utilized to generate point predictions, provided no significant weather fluctuations occur. For example, if the 1969-70 estimate (in thousand metric tons) were used as the explanatory variables and the actual 1972-73 rice production (in thousand metric tons) as the dependent variable, we obtain:

(12) $X_{r72/73} = \underset{(.09)}{1.66 + 1.04} X_{r\,69/70}$ r = .97 (First Forecast)

(13) $X_{r\,72/73} = 30.45 + 1.06 X_{r69/70}$ r = .94 (Second Forecast)

The estimated Theil U coefficients (1966) defined by (8) for palay production, area harvested, and yield changes are given in Tables 9 to 11. Majority of the coefficients are greater than one at the regional and national level. At the national level, the Theil coefficients range from .45 to .71 for palay production; 1.49 to 1.98 for area harvested; and 1.19 to .84 for palay yields. Evidently, majority of the coefficients for the second forecasts are generally lower than the first.

Nevertheless, the evidence indicated that the BAEcon rice production survey estimates should be used with caution when predicting the levels of regional and national changes in rice production, area harvested, and yields. However, to analyze the "seriousness" of the situation depicted by the Theil coefficients, the numerator of the former was decomposed according to equation (9). The decomposition results are given in Tables 12 to 14. As shown in the latter, central tendency errors account for only a small portion of the total bias. It is basically the incomplete covariation errors comprising a large share of the aggregate bias.[9] Hence, the situation is not really that serious but "hopeless" according to Theil (1966) because the BAEcon statistical personnel can not do much to significantly improve the correlation between actual and predicted changes within the existing sampling design.

An alternative model to predict changes will be a set of simple supply response functions. For example, a rice land equation defined as:[10]

$$(14)\ H_{r_t} = \underset{}{2804} + \underset{(50.07)}{63.65} \left(Y_{r_{t-1}} P^f_{r_{t-1}} \Big/ Y_{c_{t-1}} P_{c_{t-1}}\right)^i - \underset{(42.34)}{68.35} \left(Y_{r_{t-1}} P^f_{r_{t-1}} \Big/ Y_{c_{t-1}} P_{c_{t-1}}\right)^d + \underset{(36.84)}{116.03} (D_r),\ R^2 = .46$$

where:

$Y_{r_{t-1}}$: rice yields in kilograms at period t-1.

$P^f_{r_{t-1}}$: farm palay price per kilogram at period t-1.

$Y_{c_{t-1}}$: corn yields in kilograms at period t-1.

$P_{c_{t-1}}$: corn price per kilogram at period t-1.

D_r : zero before 1967 and 1 after 1967.

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[9] It ranges from 45 to 99 per cent at the regional level for rice production changes.

[10] The equation was estimated by Rodriguez (1974) using Wolfram's decomposition technique for the period 1956 to 1972.

The standard errors in parenthesis yielded a Theil coefficient .49 within its period of fit. The lesson is clear. Simple and low-st econometric models can also be used to make crop predictions. fact, correlating rice production and rice price will result in a wer loss function value as expressed in (2).

The information inaccuracy indices depicted by equation (10) e given in Table 15. The absolute value of the former for the area oportion ranges from .05 to 3.05 per cent in contrast to the oduction proportion estimates of .28 to 2.27 per cent. Based ı these findings, it is obvious that the BAEcon estimates of pa-y area and production proportions at the national and regional vels are satisfactory. Such conclusion remains unaltered even if parate information inaccuracy indices for the wet and dry season e computed (Tables 16 and 17).

onclusions

The study attempted to evaluate the accuracy of BAEcon's ce crop production forecasts according to the following dimensions:

(a) Absolute levels

(b) Estimated changes

(c) Estimate of relative magnitudes

The findings are:

(1) Within a given crop period, the forecasted rice production levels are statistically acceptable.

(2) Although no formal statistical tests can be undertaken for the information inaccuracy indices, the small values obtained for the latter within the period examined indicate that the area harvested and production proportion estimates of BAEcon are quite precise.

(3) The crop estimates do not keep track of actual changes in rice production, area harvested and yields. This is because the survey made was merely designed for point estimates. It is recommended that simple supply response models be used to make such short-term change. Perhaps, even magnitude forecasts can serve as a consistency check to the survey estimates.

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TABLE 1–A

Comparison Mean Actual and Forecasted Palay Production and Standard Deviation, by Region, Philippines, 1970-77

egion	Production (000 m.t.)					
	Mean			Standard Deviation		
	Forecast 1	Forecast 2	Actual	Forecast 1	Forecast 2	Actual
Region	5.97 (.25)	581 (.27)	554 (.18)	154	100	95
n Valley	700 (.22)	696 (.22)	675 (.14)	154	154	94
Luzon	1015 (.19)	966 (.19)	949 (.15)	197	186	147
rn Tagalog	717 (.11)	705 (.08)	694 (.11)	78	59	77
egion	547 (.18)	566 (.17)	540 (.17)	97	95	92
n Visayas	670 (.10)	673 (.16)	671 (.17)	69	109	117
l Visayas	120 (.19)	108 (.33)	110 (.17)	23	36	19
n Visayas	262 (.18)	245 (.16)	220 (.10)	48	40	21
n Mindanao	236 (.31)	225 (.36)	228 (.28)	73	80	65
ern Mindanao	395 (.29)	394 (.25)	348 (.21)	113	98	74
ern Mindanao	535 (.23)	554 (.13)	519 (.16)	121	74	77
pines	5792 (.13)	5743 (.11)	5495 (.12)	736	635	634

rs in parenthesis are coefficients of variation parameter.

TABLE 1-B

Comparison Mean Actual and Forecasted Harvested Area of Palay and Standard Deviation by Region, Philippines, 1970-1977

Region	Area (Hectares)					
	Mean			Standard Deviation		
	Forecast 1	Forecast 2	Actual	Forecast 1	Forecast 2	Actual
Ilocos Region	346,286 (.12)	350,521 (.12)	343,850 (.09)	43,206	41,811	34,183
Cagayan Valley	374,246 (.14)	386,525 (.10)	384,654 (.10)	53,178	39,537	38,920
Central Luzon	457,851 (.12)	446,984 (.13)	451,794 (.09)	56,249	56,009	38,887
Southern Tagalog	462,889 (.14)	440,541 (.15)	429,376 (.08)	[illegible]	49,642	32,232
Bicol Region	321,686 (.08)	320,123 (.08)	324,714 (.09)	24,814	26,539	28,753
Western Visayas	421,316 (.05)	411,774 (.10)	410,403 (.10)	22,883	41,777	41,468
Central Visayas	99,881 (.24)	89,044 (.18)	83,145 (.15)	23,664	15,724	12,208
Eastern Visayas	202,213 (.17)	195,916 (.10)	182,051 (.08)	33,537	19,870	15,101
Western Mindanao	144,011 (.17)	131,130 (.15)	132,920 (.07)	24,985	19,787	8,684
Northern Mindanao	280,888 (.28)	285,100 (.31)	262,441 (.19)	77,712	87,496	48,681
Southern Mindanao	336,178 (.12)	340,221 (.13)	330,444 (.13)	38,861	45,147	42,558
PHILIPPINES	3,447,445 (.08)	3,333,568 (.09)	3,335,891 (.06)	268,361	293,857	211,421

Numbers in parenthesis are coefficients of variation parameter.

TABLE 1-C

Comparison Mean Actual and Forecasted Yield of Palay and Standard Deviation by Region, Philippines, 1970-1977

Region	Yield (kg.)					
	Mean			Standard Deviation		
	Forecast 1	Forecast 2	Actual	Forecast 1	Forecast 2	Actual
s Region	1733 (.14)	1675 (.18)	1625 (.16)	237	296	265
yan Valley	1852 (.09)	1860 (.06)	1750 (.07)	165	108	120
ral Luzon	2208 (.12)	2155 (.13)	2094 (.14)	266	283	288
hern Tagalog	1568 (.13)	1616 (.13)	1613 (.08)	211	204	130
Region	1698 (.15)	1768 (.15)	1663 (.15)	258	266	258
ern Visayas	1588 (.07)	1628 (.09)	1606 (.10)	115	142	155
ral Visayas	1249 (.25)	1214 (.27)	1325 (.12)	318	324	164
ern Visayas	1304 (.17)	1249 (.13)	1206 (.07)	220	162	90
ern Mindanao	1614 (.26)	1724 (.23)	1694 (.23)	420	401	384
hern Mindanao	1414 (.13)	1391 (.14)	1338 (.15)	186	130	196
hern Mindanao	1590 (.18)	1633 (.08)	1575 (.08)	285	136	181
LIPPINES	1678 (.06)	1668 (.06)	1638 (.07)	108	95	122

ers in parenthesis are coefficients of variation parameter.

TABLE 2

Regression Equations for Palay Production by Region and Type of Equation, Philippines, 1970-1977

Region	Dependent Variable	Explanatory Variable	Linear			Double Logarithmic		
			a	Regression Coefficient	r	Log a	Regression Coefficient	r
Ilocos Region	Prod'n ac	Prod'n ft 1	521.52	0.05 (0.43)	0.05	6.27	0.01 (0.50)	0.004
	Prod'n ac	Prod'n ft 2	201.53	0.61 (0.37)	0.56	2.13	0.66 (0.40)	0.55
Cagayan Valley	Prod'n ac	Prod'n ft 1	404.31	0.39 (0.19)	0.63	3.53	0.46 (0.17)	0.73
	Prod'n ac	Prod'n ft 2	256.47	0.58 (0.30)	0.62	1.76	0.72 (0.30)	0.70
Central Luzon	Prod'n ac	Prod'n ft 1	416.80	0.52 (0.22)	0.70	2.15	0.68 (0.22)	0.79
	Prod'n ac	Prod'n ft 2	411.97	0.56 (0.23)	0.71	2.45	0.64 (0.23)	0.75
Southern Tagalog	Prod'n ac	Prod'n ft 1	134.09	0.78 (0.24)	0.79	1.30	0.80 (0.27)	0.77
	Prod'n ac	Prod'n ft 2	−24.01	1.02 (0.33)	0.79	0.04	0.99 (0.33)	0.77
Bicol Region	Prod'n ac	Prod'n ft 1	228.40	0.57 (0.31)	0.60	2.76	0.56 (0.36)	0.54
	Prod'n ac	Prod'n ft 2	153.43	0.68 (0.28)	0.71	1.75	0.72 (0.32)	0.68
Western Visayas	Prod'n ac	Prod'n ft 1	−331.63	1.50 (0.33)	0.88	−2.82	1.48 (0.34)	0.87
	Prod'n ac	Prod'n ft 2	2.51	0.99 (0.17)	0.92	−0.35	0.95 (0.17)	0.91
Central Visayas	Prod'n ac	Prod'n ft 1	39.27	0.59 (0.24)	0.71	1.15	0.74 (0.26)	0.76
	Prod'n ac	Prod'n ft 2	77.19	0.30 (0.17)	0.58	3.32	0.29 (0.18)	0.56
Eastern Visayas	Prod'n ac	Prod'n ft 1	206.56	0.05 (0.18)	0.10	4.99	0.07 (0.22)	0.14
	Prod'n ac	Prod'n ft 2	140.61	0.32 (0.17)	0.61	3.39	0.36 (0.18)	0.63
Western Mindanao	Prod'n ac	Prod'n ft 1	65.09	0.69 (0.23)	0.77	2.28	0.58 (0.23)	0.71
	Prod'n ac	Prod'n ft 2	71.83	0.69 (0.18)	0.84	1.80	0.67 (0.19)	0.82
Northern Mindanao	Prod'n ac	Prod'n ft 1	227.82	0.31 (0.24)	0.47	3.12	0.46 (0.26)	0.58
	Prod'n ac	Prod'n ft 2	188.74	0.41 (0.26)	0.54	2.34	0.59 (0.27)	0.66
Southern Mindanao	Prod'n ac	Prod'n ft 1	372.04	0.27 (0.24)	0.42	4.76	0.24 (0.27)	0.33
	Prod'n ac	Prod'n ft 2	185.04	0.60 (0.35)	0.57	1.73	0.71 (0.42)	0.57
PHILIPPINES	Prod'n ac	Prod'n ft 1	1119.88	0.76 (0.17)	0.88	1.63	0.81 (0.19)	0.87
	Prod'n ac	Prod'n ft 2	121.92	0.94 (0.14)	0.94	0.25	0.97 (0.14)	0.94

Numbers in parenthesis are standard errors .

TABLE 3

Regression Equations for Forecasted Palay Area Harvested by Region and Type of Equation, Philippines, 1970-1977

Region	Dependent Variable	Explanatory Variable	Linear			Double Logarithmic		
			a	Regression Coefficient	r	Log a	Regression Coefficient	r
os Region	Area ac	Area ft 1	104,581	−0.29 (0.30)	0.37	16.55	−0.30 (0.28)	0.40
	Area ac	Area ft 2	408,123	−0.18 (0.33)	0.22	15.05	−0.18 (0.32)	[illegible]
ayan Valley	Area ac	Area ft 1	176,834	0.56 (0.19)	0.76	5.24	0.59 (0.17)	0.81
	Area ac	Area ft 2	144,387	0.62 (0.31)	0.63	3.72	0.71 (0.31)	[illegible]
ntral Luzon	Area ac	Area ft 1	249,380	0.44 (0.22)	0.64	7.12	0.45 (0.23)	[illegible]
	Area ac	Area ft 2	217,024	0.53 (0.19)	0.75	6.58	0.50 (0.19)	[illegible]
uthern Tagalog	Area ac	Area ft 1	491,264	−0.13 (0.19)	0.26	14.68	−0.13 (0.22)	[illegible]
	Area ac	Area ft 2	227,641	0.46 (0.19)	0.71	6.26	0.52 (0.19)	[illegible]
ol Region	Area ac	Area ft 1	268,108	0.18 (0.47)	0.14	10.49	0.17 (0.47)	0.14
	Area ac	Area ft 2	115,842	0.65 (0.35)	0.60	5.19	0.59 (0.35)	[illegible]
stern Visayas	Area ac	Area ft 1	213,899	1.48 (0.43)	0.82	−6.57	1.50 (0.45)	[illegible]
	Area ac	Area ft 2	7,451	0.98 (0.07)	0.98	0.31	0.98 (0.07)	[illegible]
ntral Visayas	Area ac	Area ft 1	117,786	−0.35 (0.16)	0.67	17.03	−0.50 (0.22)	[illegible]
	Area ac	Area ft 2	47,418	0.40 (0.27)	0.52	5.37	0.52 (0.27)	[illegible]
stern Visayas	Area ac	Area ft 1	141,060	0.20 (0.16)	0.45	9.70	0.20 (0.19)	[illegible]
	Area ac	Area ft 2	123,918	0.30 (0.29)	0.39	8.35	0.31 (0.32)	[illegible]
estern Mindanao	Area ac	Area ft 1	125,025	0.05 (0.14)	0.14	10.99	0.07 (0.15)	[illegible]
	Area ac	Area ft 2	98,551	0.26 (0.14)	0.60	9.07	0.23 (0.14)	[illegible]
orthern Mindanao	Area ac	Area ft 1	174,754	0.31 (0.22)	0.50	7.48	0.40 (0.25)	[illegible]
	Area ac	Area ft 2	168,964	0.33 (0.18)	0.59	6.79	0.45 (0.20)	[illegible]
outhern Mindanao	Area ac	Area ft 1	40,273	0.86 (0.28)	0.79	1.18	0.91 (0.31)	[illegible]
	Area ac	Area ft 2	76,056	0.75 (0.23)	0.79	2.92	0.77 (0.27)	[illegible]
HILIPPINES	Area ac	Area ft 1	1,489,953	0.54 (0.24)	0.68	6.54	0.56 (0.24)	[illegible]
	Area ac	Area ft 2	1,370,651	0.58 (0.17)	0.81	5.78	0.61 (0.17)	[illegible]

bers in parenthesis are standard errors.

TABLE 4

Regression Equations for Forecasted Yield of Palay by Region and Type of Equation, Philippines, 1970-1977

Region	Dependent Variable	Explanatory Variable	Linear: a	Linear: Regression Coefficient	Linear: r	Double Logarithmic: Log a	Double Logarithmic: Regression Coefficient	Double Logarithmic: r
Ilocos Region	Yield ac	Yield ft 1	282.80	0.77 (0.33)	0.69	1.62	0.77 (0.39)	0.63
	Yield ac	Yield ft 2	473.67	0.69 (0.23)	0.77	2.64	0.64 (0.25)	0.72
Cagayan Valley	Yield ac	Yield ft 1	1572.21	0.10 (0.29)	0.14	6.54	-0.12 (0.29)	0.17
	Yield ac	Yield ft 2	470.06	0.69 (0.36)	0.62	1.97	0.73 (0.36)	0.64
Central Luzon	Yield ac	Yield ft 1	401.84	0.77 (0.30)	0.72	1.49	0.80 (0.31)	0.73
	Yield ac	Yield ft 2	733.82	0.63 (0.32)	0.63	2.68	0.65 (0.33)	0.62
Southern Tagalog	Yield ac	Yield ft 1	1787.88	−0.11 (0.26)	0.17	8.26	−0.12 (0.23)	0.20
	Yield ac	Yield ft 2	1007.31	0.37 (0.22)	0.57	4.79	0.35 (0.22)	0.55
Bicol Region	Yield ac	Yield ft 1	1339.82	0.19 (0.39)	0.20	5.81	0.21 (0.40)	0.20
	Yield ac	Yield ft 2	1499.44	0.09 (0.39)	0.10	6.42	0.13 (0.41)	0.14
Western Visayas	Yield ac	Yield ft 1	−51.91	1.04 (0.34)	0.77	0.16	0.98 (0.32)	0.78
	Yield ac	Yield ft 2	91.96	0.93 (0.23)	0.85	0.68	0.91 (0.22)	0.86
Central Visayas	Yield ac	Yield ft 1	1003.57	0.26 (0.17)	0.53	6.07	0.16 (0.14)	0.17
	Yield ac	Yield ft 2	687.58	0.36 (0.13)	0.76	5.35	0.26 (0.10)	0.71
Eastern Visayas	Yield ac	Yield ft 1	1102.44	0.08 (0.16)	0.20	6.40	0.10 (0.20)	0.20
	Yield ac	Yield ft 2	853.90	0.28 (0.20)	0.51	4.83	0.32 (0.21)	0.52
Western Mindanao	Yield ac	Yield ft 1	453.09	0.77 (0.20)	0.84	2.08	0.72 (0.22)	0.80
	Yield ac	Yield ft 2	- 404.64	0.75 (0.24)	0.78	-1.87	0.75 (0.27)	0.75
Northern Mindanao	Yield ac	Yield ft 1	1133.55	0.14 (0.40)	0.14	6.67	0.07 (0.43)	0.07
	Yield ac	Yield ft 2	−385.74	1.23 (0.35)	0.82	−2.71	1.37 (0.43)	0.79
Southern Mindanao	Yield ac	Yield ft 1	1709.53	−0.08 (0.18)	0.17	7.85	−0.07 (0.16)	0.17
	Yield ac	Yield ft 2	1682.15	−0.07 (0.39)	0.07	7.84	−0.06 (0.39)	0.07
PHILIPPINES	Yield ac	Yield ft 1	1106.18	0.32 (0.34)	0.36	5.23	0.29 (0.35)	0.32
	Yield ac	Yield ft 2	91.86	0.93 (0.36)	0.72	0.08	0.99 (0.36)	0.75

bers in parenthesis are standard errors.

Regression Equations for Forecasted Total Palay Production by Crop Year, Philippines

Crop Year	Dependent Variable	Explanatory Variable	Linear			Double Logarithmic		
			a	Regression Coefficient	r	Log a	Regression Coefficient	r
1969-1970	Prod'n ac	Prod'n ft 1	14.64	1.02 (0.10)	0.96	−0.56	1.10 (0.10)	0.96
	Prod'n ac	Prod'n ft 2	−4.99	0.93 (0.03)	0.99	−0.10	1.00 (0.03)	0.99
1970-1971	Prod'n ac	Prod'n ft 1	−21.47	1.02 (0.09)	0.97	−0.10	1.01 (0.09)	0.96
	Prod'n ac	Prod'n ft 2	−62.27	1.11 (0.10)	0.96	−0.38	1.05 (0.05)	0.99
1971-1972	Prod'n ac	Prod'n ft 1	29.23	0.93 (0.12)	0.93	−0.44	1.07 (0.09)	0.97
	Prod'n ac	Prod'n ft 2	41.27	0.91 (0.11)	0.94	1.18	0.81 (0.09)	0.95
1972-1973	Prod'n ac	Prod'n ft 1	4.42	0.87 (0.08)	0.96	0.65	0.87 (0.09)	0.96
	Prod'n ac	Prod'n ft 2	14.11	0.92 ([illegible])	0.97	0.82	0.86 ([illegible])	0.98

TABLE 5 (cont'd.)

1973-1974	Prod'n ac	Prod'n ft 1	−15.28	0.91 (0.15)	0.90	−0.20	1.01 (0.13)	0.93
	Prod'n ac	Prod'n ft 2	−33.26	0.96 (0.14)	0.92	−0.32	1.03 (0.13)	0.94
1974-1975	Prod'n ac	Prod'n ft 1	41.04	0.87 (0.06)	0.97	0.38	0.93 (0.05)	0.98
	Prod'n ac	Prod'n ft 2	54.31	0.84 (0.06)	0.98	0.47	0.92 (0.05)	0.99
1975-1976	Prod'n ac	Prod'n ft 1	81.80	0.77 (0.09)	0.94	0.15	0.96 (0.08)	0.96
	Prod'n ac	Prod'n ft 2	42.95	0.90 (0.06)	0.98	0.34	0.94 (0.05)	0.99
1976-1977	Prod'n ac	Prod'n ft 1	17.23	0.95 (0.08)	0.96	0.18	0.97 (0.06)	0.98
	Prod'n ac	Prod'n ft 2	−8.72	1.02 (0.06)	0.98	0.01	1.00 (0.04)	0.99

Note: n = 11 in all equations
Numbers in parenthesis are standard errors.

Regression Equations for Forecasted Total Area Harvested, by Crop Year, Philippines

Crop Year	Dependent Variable	Explanatory Variable	Linear			Double Logarithmic		
			a	Regression Coefficient	r	Log a	Regression Coefficient	r
1969-1970	Area ac	Area ft 1	40,898.58	0.76 (0.20)	0.79	–4.49	1.34 (0.26)	0.87
	Area ac	Area ft 2	–6,289.08	1.00 (0.04)	0.99	0.002	1.00 (0.03)	0.99
1970-1971	Area ac	Area ft 1	–13,367.11	1.02 (0.10)	0.96	0.40	0.97 (0.09)	0.96
	Area ac	Area ft 2	–11,782.00	1.03 (0.04)	0.99	–0.29	1.02 (0.02)	0.99
1971-1972	Area ac	Area ft 1	5,372.05	1.00 (0.13)	0.93	–0.66	1.05 (0.09)	0.96
	Area ac	Area ft 2	5,410.88	1.01 (0.12)	0.94	–0.17	1.02 (0.08)	0.97
1972-1973	Area ac	Area ft 1	12,030.75	0.96 (0.11)	0.94	–0.20	1.02 (0.11)	0.95
	Area ac	Area ft 2	33,058.68	0.88 (0.12)	0.93	0.85	0.93 ([illegible])	0.95

TABLE 6 (cont'd.)

1973-1974	Area ac	Area ft 1	993.08	0.89 (0.13)	0.92	−0.99	1.07 (0.11)	0.95
	Area ac	Area ft 2	7,662.42	0.86 (0.14)	0.91	−0.97	1.06 (0.12)	0.94
1974-1975	Area ac	Area ft 1	8,056.81	1.00 (0.03)	0.99	0.39	0.97 (0.03)	0.99
	Area ac	Area ft 2	11,183.50	0.96 (0.02)	1.00	0.49	0.96 (0.01)	1.00
1975-1976	Area ac	Area ft 1	17,280.49	0.91 (0.06)	0.98	0.44	0.96 (0.04)	0.99
	Area ac	Area ft 2	1,465.85	0.98 (0.05)	0.98	−0.11	1.01 (0.04)	0.99
1976-1977	Area ac	Area ft 1	10,717.35	0.97 (0.05)	0.98	0.25	0.98 (0.04)	0.99
	Area ac	Area ft 2	−4,617.93	1.03 (0.03)	0.99	+0.02	1.00 (0.03)	0.99

Note: n = 11 in all equations.

Numbers in parenthesis are standard errors.

Regression Equations for Forecasted Total Palay Yield by Crop Year, Philippines

Crop Year	Dependent Variable	Explanatory Variable	Linear			Double Logarithmic		
			a	Regression Coefficient	r	Log a	Regression Coefficient	r
1969-1970	Yield ac	Yield ft 1	821.54	0.58 (0.15)	0.79	4.48	0.40 (0.14)	0.69
	Yield ac	Yield ft 2	432.68	0.72 (0.16)	0.83	2.26	0.69 (0.19)	0.78
1970-1971	Yield ac	Yield ft 1	219.65	0.86 (0.14)	0.90	1.16	0.84 (0.16)	0.87
	Yield ac	Yield ft 2	−192.78	1.08 (0.23)	0.84	−0.57	1.07 (0.22)	0.85
1971-1972	Yield ac	Yield ft 1	647.96	0.56 (0.35)	0.47	2.65	0.63 (0.34)	0.53
	Yield ac	Yield ft 2	923.43	0.38 (0.22)	0.50	5.09	0.30 (0.16)	0.54
1972-1973	Yield ac	Yield ft 1	718.69	0.43 (0.14)	0.70	4.04	0.43 (0.18)	0.62
	Yield ac	Yield ft 2	818.88	0.39 (0.13)	0.71	4.27	0.41 (0.16)	0.66

TABLE 7 (cont'd.)

1973-1974	Yield ac	Yield ft 1	633.78	0.59 (0.25)	0.62	2.95	0.60 (0.25)	0.62
	Yield ac	Yield ft 2	564.53	0.65 (0.23)	0.69	2.64	0.64 (0.22)	0.70
1974-1975	Yield ac	Yield ft 1	291.55	0.76 (0.16)	0.84	1.14	0.84 (0.18)	0.84
	Yield ac	Yield ft 2	377.24	0.73 (0.14)	0.87	1.67	0.77 (0.15)	0.86
1975-1976	Yield ac	Yield ft 1	454.92	0.68 (0.20)	0.75	2.20	0.70 (0.25)	0.68
	Yield ac	Yield ft 2	498.33	0.69 (0.07)	0.96	2.10	0.72 (0.07)	0.96
1976-1977	Yield ac	Yield ft 1	169.85	0.89 (0.14)	0.90	0.86	0.88 (0.15)	0.89
	Yield ac	Yield ft 2	19.46	1.00 (0.10)	0.96	−0.09	1.01 (0.11)	0.95

Note: n = 11 in all regression equations.
Numbers in parenthesis are standard errors.

Cross-Section Regression Intercepts
(Linear Form)

Independent Variables	Dependent Variables							
	1969-1970	1970-1971	1971-1972	1972-1973	1973-1974	1974-1975	1975-1976	1976-1977
1969 — 1970	14.64 −4.99	−2.72 −9.82	6.66 24.54	1.66 30.45	24.89 5.36	22.55 35.49	23.92 −5.27	−31.11 −16.40
1970 — 1971		−21.47 −62.27	−54.78 −50.00	4.22 24.13	−46.14 −59.51	12.32 24.77	13.92 −3.74	−33.72 −26.70
1971 — 1972			29.23 41.27	72.86 91.27	65.65 54.13	118.36 132.59	142.15 107.41	58.96 58.70
1972 — 1973				4.42 14.11	−8.58 −21.40	12.93 23.70	11.94 12.17	−31.17 −32.32
1973 — 1974					−15.28 −33.26	−2.95 10.88	−9.80 −37.56	−52.75 53.23
1974 — 1975						41.04 54.31	23.47 −4.91	−16.81 −31.42
1975 — 1976							81.80 42.95	20.92 10.01
1976 — 1977								17.23 −8.72

Note: First number in a cell is derived from first forecasts while the second is from the second forecasts.

TABLE 8B

Cross-Section Sample Correlation Coefficients
(Linear Form)

Independent Variables	Dependent Variables							
	1969-1970	1970-1971	1971-1972	1972-1973	1973-1974	1974-1975	1975-1976	1976-1977
1969 – 1970	1.02 .93	.97 .98	1.00 .97	1.04 1.06	.78 .83	.84 .80	.72 .83	.85 .84
1970 – 1971		1.02 1.11	1.15 1.11	1.07 1.10	.92 .96	.87 .84	.76 .85	.87 .88
1971 – 1972			.93 .91	.85 .89	.69 .72	.64 .60	.52 .62	.68 .69
1972 – 1973				.87 .92	.71 .75	.72 .69	.62 .72	.73 .74
1973 – 1974					.91 .96	.94 .90	.83 .95	.94 .96
1974 – 1975						.87 .84	.79 .90	.89 .94
1975 – 1976							.77 .90	.90 .94
1976 – 1977								.95 1.02

Note: First number in a cell is derived from first forecasts, the second, from the second forecasts.

Cross-Section Sample Correlation Coefficients
(Linear Form)

Independent Variables	Dependent Variables							
	1969-1970	1970-1971	1971-1972	1972-1973	1973-1974	1974-1975	1975-1976	1976-1977
1969 – 1970	0.96 0.99	0.96 0.90	0.84 0.85	0.91 0.94	0.85 0.87	0.96 0.96	0.92 0.94	0.96 0.91
1970 – 1971		0.97 0.96	0.92 0.92	0.95 0.93	0.95 0.96	0.95 0.95	0.91 0.91	0.93 0.90
1971 – 1972			0.93 0.94	0.95 0.94	0.89 0.91	0.87 0.86	0.78 0.83	0.91 0.89
1972 – 1973				0.96 0.97	0.92 0.93	0.97 0.98	0.94 0.96	0.97 0.95
1973-1974					0.90 0.92	0.99 0.99	0.97 0.98	0.97 0.95
1974 – 1975						0.97 0.98	0.97 0.99	0.98 0.98
1975 – 1976							0.95 0.98	0.95 0.97
1976 – 1977								0.96 0.98

Note: First number in a cell is derived from first forecasts, the second from the second forecasts.

TABLE 9

Estimated Regional Theil U Coefficients of Production Forecast, Crop Years 1970 – 1977

Region	Forecast 1	Forecast 2
Ilocos Region	1.6631	0.9706
Cagayan Valley	1.6145	1.1182
Central Luzon	0.9491	1.0542
Southern Tagalog	1.6506	1.3699
Bicol Region	1.3738	1.1194
Western Visayas	0.5700	0.4961
Central Visayas	1.2029	2.2071
Eastern Visayas	3.3088	1.7620
Western Mindanao	1.1894	1.3654
Northern Mindanao	2.2800	2.0103
Southern Mindanao	1.2417	1.0447
PHILIPPINES	0.7122	0.4533

TABLE 10

timated Regional Theil U Coefficient of Harvested Area Forecast, Crop Years 1970 – 1977

Region	Forecast 1	Forecast 2
Ilocos Region	1.7570	1.5466
Cagayan Valley	2.1347	1.7262
Central Luzon	1.4280	1.2882
Southern Tagalog	5.6116	1.8858
Bicol Region	1.5371	1.2376
Western Visayas	1.0040	0.9176
Central Visayas	2.5722	1.1187
Eastern Visayas	3.4658	2.4815
Western Mindanao	3.0714	3.1226
Northern Mindanao	6.0285	6.3536
Southern Mindanao	1.1563	1.3130
PHILIPPINES	1.9523	1.4865

TABLE 11

Estimated Theil U Coefficients of Palay Yield Forecast, Crop Years 1970-1977

Region	Forecast 1	Forecast 2
Ilocos Region	1.1337	1.0477
Cagayan Valley	1.2175	0.7867
Central Luzon	1.0585	1.2546
Southern Tagalog	2.5084	1.9461
Bicol Region	1.254	1.6050
Western Visayas	0.8052	0.2877
Central Visayas	2.2908	1.9599
Eastern Visayas	2.7248	1.3163
Western Mindanao	0.9621	1.1137
Northern Mindanao	1.1661	0.6042
Southern Mindanao	1.5531	1.5213
PHILIPPINES	1.1893	0.8378

Variance, Covariance and Biased Portion of Palay Production Changes by Region, Crop Years 1970 – 1977

Region	Variance		Covariance		Biased Portion	
	Forecast 1	Forecast 2	Forecast 1	Forecast 2	Forecast 1	Forecast 2
Ilocos Region	0.0174	0.0155	0.9639	0.9835	0.0187	0.0010
Cagayan Valley	0.3782	0.3906	0.6218	0.5916	0.0000	0.0178
Central Luzon	0.0007	0.0078	0.9961	0.9891	0.0032	0.0031
Southern Tagalog	0.1485	0.0083	0.8496	0.8835	0.0019	0.0282
Bicol Region	0.0698	0.0052	0.9209	0.9509	0.0093	0.0439
Western Visayas	0.1271	0.2265	0.6829	0.7221	0.1900	0.0514
Central Visayas	0.3807	0.5448	0.6125	0.4547	0.0068	0.0005
Eastern Visayas	0.3983	0.3773	0.5892	0.6168	0.0125	0.0059
Western Mindanao	0.0381	0.2489	0.7740	0.7457	0.1879	0.0054
Northern Mindanao	0.4305	0.4945	0.5225	0.5046	0.0470	0.0009
Southern Mindanao	0.0918	0.1883	0.8164	0.8013	0.0918	0.0104
PHILIPPINES	0.0357	0.1970	0.9516	0.7438	0.0127	0.0592

TABLE 13

Variance, Covariance and Biased Portion of Changes in Palay Harvested Area by Region, Philippines, Crop Years 1970-1977

Region	Variance		Covariance		Biased Portion	
	Forecast 1	Forecast 2	Forecast 1	Forecast 2	Forecast 1	Forecast 2
Ilocos Region	0.0007	0.0098	0.9880	0.9901	0.0113	0.0001
Cagayan Valley	0.7196	0.6438	0.2627	0.2766	0.0177	0.0796
Central Luzon	0.2033	0.2897	0.7921	0.7103	0.0046	0.0000
Southern Tagalog	0.5923	0.5400	0.3601	0.4547	0.0476	0.0053
Bicol Region	0.0039	0.0130	0.9663	0.9740	0.0298	0.0130
Western Visayas	0.0159	0.1026	0.7562	0.8290	0.2279	0.0684
Central Visayas	0.1089	0.0995	0.8183	0.8908	0.0728	0.0097
Eastern Visayas	0.3950	0.2384	0.5971	0.7590	0.0079	0.0026
Western Mindanao	0.6507	0.6103	0.3320	0.3846	0.0173	0.0051
Northern Mindanao	0.9359	0.9483	0.0525	0.0512	0.0116	0.0005
Southern Mindanao	0.0221	0.0001	0.9537	0.9986	0.0242	0.0013
PHILIPPINES	0.8850	0.5780	0.0199	0.4134	0.0951	0.0086

Variance, Covariance and Biased Portion of Palay Production
Changes by Region, Crop Years 1970 – 1977

Region	Variance		Covariance		Biased Portion	
	Forecast 1	Forecast 2	Forecast 1	Forecast 2	Forecast 1	Forecast 2
Ilocos Region	0.0045	0.0041	0.9881	0.9947	0.0074	0.0012
Cagayan Valley	0.0086	0.0052	0.9866	0.9906	0.0048	0.0042
Central Luzon	0.0013	0.0000	0.9962	0.9993	0.0025	0.0007
Southern Tagalog	0.1466	0.1315	0.8194	0.8638	0.0340	0.0047
Bicol Region	0.0161	0.0000	0.9836	0.9972	0.0003	0.0028
Western Visayas	0.0167	0.0029	0.9488	0.8094	0.0345	0.0877
Central Visayas	0.1391	0.5203	0.7910	0.4782	0.0699	0.0015
Eastern Visayas	0.2734	0.3079	0.7257	0.6896	0.0009	0.0025
Western Mindanao	0.0007	0.0182	0.9875	0.9791	0.0018	0.0027
Northern Mindanao	0.0147	0.4553	0.9478	0.5445	0.0375	0.0002
Southern Mindanao	0.0000	0.0099	0.8459	0.9753	0.1541	0.0148
PHILIPPINES	0.0317	0.1128	0.8984	0.8227	0.0699	0.0645

TABLE 15

Information Inaccuracy Indices, Crop Years 1969-1970 to 1976-1977

Crop Year	Palay Area Proportion		Production Proportion	
	Forecast 1	Forecast 2	Forecast 1	Forecast 2
1969 – 1970	–0.0305	–0.0352	–0.0126	–0.0009
1970 – 1971	–0.0059	–0.0008	–0.0093	0.0060
1971 – 1972	–0.0087	–0.0070	–0.0121	–0.0142
1972 – 1973	–0.0098	–0.0290	–0.0128	–0.0083
1973 – 1974	–0.0136	–0.0149	–0.0227	–0.0195
1974 – 1975	–0.0011	–0.0005	–0.0059	–0.0056
1975 – 1976	–0.0020	–0.0017	–0.0111	–0.0039
1976 – 1977	–0.0019	–0.0006	–0.0062	–0.0028

TABLE 16

Information Inaccuracy Indices, Wet Season, Crop Years 1972-1973 to 1976-1977

Crop Year	Production Proportion		Palay Area Proportion	
	Forecast 1	Forecast 2	Forecast 1	Forecast 2
1972 – 1973	–0.0153	–0.0232	–0.0231	–0.0142
1973 – 1974	–0.0145	*	–0.0207	*
1974 – 1975	–0.0034	*	–0.0096	*
1975 – 1976	–0.0014	–0.0019	–0.0056	–0.0029
1976 – 1977	–0.0032	–0.0015	–0.0101	–0.0033

* Computation not possible.

TABLE 17

Information Inaccuracy Indices, Dry Season, Crop Years, 1972-73 to 1976-77

Crop Year	Palay Area Proportion		Production Proportion	
	Forecast 1	Forecast 2	Forecast 1	Forecast 2
1972 – 1973	–0.0303	–0.0360	–0.0242	–0.0119
1973 – 1974	–0.0223	–0.0263	–0.0829	–0.1050
1974 – 1975	–0.0029	–0.0051	–0.0041	–0.0402
1975 – 1976	–0.0075	–0.0089	–0.0305	–0.0199
1976 – 1977	–0.0035	–0.0037	–0.0023	–0.0050