

# AN ASSESSMENT OF THE POST-REHABILITATION (FERTILIZATION) OF COCONUT IN SCFDP FARMS, PHILIPPINES<sup>1</sup>

By

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## ABSTRACT

*Selected sample farms (79) under the Small Coconut Farms Development Project (SCFDP, Philippines) representing five (5) regions and nine (9) provinces were evaluated. The yield trends: (1) initial or benchmark; (2) during rehabilitation period (3-4 years); and (3) post-rehabilitation period (2) years were examined using the nut and copra yield estimation method of the PCA (MAGAT, 1995).*

*On nut yield, the benchmark average annual yield of 35 nuts/tree increased to 91 nuts/tree during the rehabilitation (rehab) period but dropped to 70 nuts/tree during the post-rehabilitation (post-rehab) period or two (2) years without fertilizer application. This 160% increase in nut production (1995) followed by a reduction of 23% at the post-rehab period is indicative of a moderate to strong residual fertilizer effect after the significant rehabilitation of palms by fertilizer application (supplying mainly N, K, Cl and S fertilizer nutrients). On copra yield, the pre-rehabilitation annual copra yield of 0.94 t/ha reached 3.01 t/ha during the rehab period, followed by a drop to 2.21 t/ha at post-rehab. The copra yield increase of 220% during the rehab (1995) is mainly due to the increase in nut yield and nut size or copra weight per nut. An average reduction of 27% during the post-rehab period was observed but in some areas the yield of palms dropped close to pre-rehabilitation nut and copra levels, suggesting lower degree of fertilizer residual effects compared to other coconut regions.*

*Implications of findings in relation to the rehabilitation by judicious fertilization of low-yielding, nutritionally-deficient non-senile palms are discussed.*

## 1. BACKGROUND AND SIGNIFICANCE

The World Bank-assisted Philippines Small Coconut Farms Development Project or SCFDP aims among many others to demonstrate the feasibility and viability of increasing farm productivity by judicious fertilization of poor-yielding nutritionally deficient small farms. The project planned to cover at least 348,000 hectares of the 3 M hectare in five years period of rehabilitation (PCA, 1989).

During the rehabilitation period, an earlier report showed a positive indicative result of the project based on 74 sample farms (8 provinces and cities in 5 regions) (Magat, 1995). Results indicated that with an average of three years of fertilizer application: (1) nuts yield increased from the average of 35 nuts to 83 nuts/tree (+142% increase); (2) copra yield increased from the average of 1.02 tons to 2.79 tons/hectare (+179% increase).

Moreover, on a per hectare basis average copra yield increased were highest in Quezon (3.78 t), Laguna (4.90 t) and Davao City (3.4 t) per year. In 1995, at 2.79 tons/hectare yield at P9.00/kg copra, an average annual net income of P 18,000/hectare was achieved compared to P5,300/hectare of unfertilized (unmanaged farms). Thus, the yield and income of the small farms were more than doubled. After the rehabilitation period of 3-4 years of annual regular fertilization, the small farms

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ceased to receive fertilizers (2-3 single fertilizers supplying nitrogen, sulfur, chlorine, potassium, phosphorus and magnesium). Thus, the previously fertilized palms are under the so called post-rehabilitation period or post-rehab, largely no application of fertilizers.

Under the post-rehab period (average of 2 years), farms could experience the positive residual effects due to the earlier (3-4 years) fertilizer application. In several residual effects studies, PCA researchers at the Davao Research Center found that chloride-fertilizers (KCl, NaCl, NH<sub>4</sub>Cl) after 3-5 years of regular application are capable of still maintaining high yield levels of nuts and copra, strongly attributed to the residual Cl in the soil and crop system of coconut palms (Magat et al, 1992).

As a field monitoring of the progress of the SCFDP rehabilitation through fertilization, an evaluation was conducted in June-July 1998.

This evaluation aims to determine the extent of the residual effects of fertilization in the SCFDP farm after the rehabilitation period or post-rehab yield trends. Such field data should be valuable in having research-based information in planning, implementing intensified or expanded coconut rehabilitation program of the industry.

## 2. METHODOLOGY

### 2.1 Sample Farms

The same sample farms (mainly planted to Tall varieties) observed in an earlier study: (An update of coconut fertilizer use efficiency and productivity of SCFDP farms) reported by Magat (1995) were used in this assessment.

The method for estimating yield in all the sample farms followed the PCA method used in obtaining the benchmark and the rehabilitation period (1995) yield data.

### 2.2 Growing Zones

Region	Province	Growing Zone <sup>1</sup>	Number of Farms
IV-A	Cavite	Dry to Intermediate	14
IV-B	Quezon	Intermediate to wet	10
	Batangas	Intermediate	2
	Laguna	Intermediate	3
VIII	Leyte	Wet	16
IX	Zamboanga City	Intermediate	15
XI	Davao City	Wet	4
	Davao Norte &	Wet	14

### 2.3 Fertilizer Application

The annual and total (4 years) fertilizer rate by province is shown in Table 1.

## 3. RESULTS AND DISCUSSION

### 3.1 Nut Yield

Table 2 shows the average yield of sampled provinces, starting with initial (1991-benchmark), rehabilitation period (1995) and post-rehabilitation or post-rehab 2-4 years after cessation of fertilizer application/1998). The post-rehab yield is also considered the residual effect or

post-fertilization effects on the yield or productivity of coconut. The variability or range of these yields in the provinces sampled and estimated at different periods are indicated in annex tables 1, 2 and 3, covering four representative regions of the country.

In 1991 (benchmark), average yield was 35 nuts/tree but after 3-4 years of rehabilitation (by fertilization), the average yield of SCFDP farm reached 91 nuts (a 160% increase), and in the following period (post-rehab), the average yield decreased to 70 nuts (-23% average reduction).

Among the provinces and cities, the rehabilitation yields varied, with farms in Batangas and Laguna areas and Davao City yielding most or over 100 nuts/tree and the Leyte farms the lowest (55 nuts/tree) (Figure 1).

On the other hand, during the post-rehab periods, nut yields in three provinces were maintained at high levels (over 79 nuts/tree/year). These are indicated by farms in Cavite, Batangas-Laguna and Davao City. However, it was noted that the post-rehab yields of Leyte province further increased over the rehab period, likely due to recovery from the strong typhoon in December/94 which resulted in a post-rehab average yield of only 55 nuts (estimated in 1995).

Figure 1 also indicates significant reduction in post-rehab yields of the SCFDP farm in Quezon, Davao Norte and Compostela, and Zamboanga City (with post rehab yield decreased strongly to the level of the benchmark yield). This suggests that the yield decline could be strong (-32 to -61%) in some growing zones and at a low rate (-4 to -9%) in some zones. The gradual reduction in yield or further increase in nut yield may be considered the significant residual effect of previous regular fertilization. This is commonly observed in field particularly with regular fertilization of phosphorus and potassium fertilizers. In coconut, Magat *et al* (1992) discovered the residual effects of chlorine fertilizers on the yield of coconut, confirmed by the positive correlation of leaf-Cl and yield. This field agronomic occurrence or phenomenon is of benefit to coconut farmers applying fertilizers as production cost per unit of produce (nuts, copra) is lower during the post-rehab period.

### 3.2 Copra Yield

Table 3 shows the average copra yield of sampled provinces, with benchmark (1991), rehab (1995) and post-rehab (1998) or residual effect. The variability or ranges of these yields in the sampled farms in the seven (7) provinces are indicated also in annex tables 1, 2 and 3.

The initial annual average yield (1991) was only 0.94t copra/ha, with the rehabilitation by fertilizer application increasing the yield to 3.01 t (or a +220% increase). This decreased to 2.21 t copra/ha during the post-rehab period (no fertilization for 2 years), an average -27% decline in copra productivity of the sampled coconut provinces and cities, during the rehab period, with farms in Quezon, Batangas and Laguna, Davao City and Davao Norte - Compostela reaching copra yields of over 3 tons/hectare, and farms in Leyte and Zamboanga City, the lowest increase (2-2.2 t/ha) (Figure 2).

Clearly, during the post-rehab period, copra yields in farms of two provinces (Cavite and Davao City) were still at high levels (over 2.5 t copralhectare). After the rehab period, only farm in Cavite and Leyte slightly increased (+1.5 to 2%). In the case of Cavite, the regular intercropping of fertilized marketable crops (coffee, pineapple, papaya, etc.) likely resulted to higher residual effects.

Also, Figure 2 showed a high drop in the post-rehab yield of copra of most SCFDP farms, particularly in Quezon, Batangas-Laguna, Davao Norte-Compostela and Zamboanga City. A copra yield reduction of -37 to -64% in even the intermediate and wet growing zones, while in farms of Davao City (with wet zone, having volcanic, well-drained deep soil but initially strongly deficient in Cl, S and S in 1991), a slight reduction of -7% was observed.

Results clearly indicates that although regular fertilization for 3-4 years is capable of improving copra yield by 220%, after cutting the fertilizer application for 2 years, yield reduction could be as high as 37-64% compared to that of the rehab yield. But in some favorable soil conditions (i.e. deep volcanic soil) and sustained soil fertility, without strong deficit in soil moisture, high copra yields are expected. This implies, a stronger positive residual effect and therefore still maintaining higher yield levels (over 2 tons copra/hectare/year) of previous fertilization on coconut under favorable field environmental conditions, especially with favorable soil and climate factors.

#### 4. CONCLUSION

Based on the results gathered recently (June-July/98) from the 79 sample SCFDP farms covering five (5) coconut regions and nine (9) coconut producing provinces and cities, the yield trends from: (1) initial (benchmark), (2) rehabilitation and (3) post-rehabilitation periods were examined, using nut and copra yield estimation method of PCA (Magat, 1995). For periods (1) and (2), an earlier assessment and subsequent report was published Magat (1994).

Nationwide, on nut yield, through rehabilitation by SCFDP fertilization, the initial average annual yield of 35 nuts/tree increased to 91 nuts/tree during the rehabilitation period (3-4 years of regular fertilization) but dropped to 70 nuts/tree, 2 years after without fertilizer application. This 160% increase in nut production at rehabilitation period (1995) and followed by a reduction of -23%, suggests significant positive response of coconuts to fertilization, followed by a moderate to strong residual effect during the post-rehab. The degree of post-rehab (no fertilization) response or residual effect strongly appears location and/or management-specific.

However, on copra yield (determined by nut yield and copra weight/nut), usually largely affected by mineral nutrition, genetic factor and water economy of soil-crop system, the initial annual average copra yield of 0.94 ton copra/hectare reached an average 3.01 t copra/ha/yr during the rehab period but followed by a drop to 2.21 ton/hectare (post-rehab). The copra yield increase of 220% at rehab period (1995) after 3-4 years of fertilizer application is mainly due to the increase in nut yield and thickness of the meat. Several PCA studies revealed that the number of nuts and copra weight/nut (also fresh meat thickness) are strongly determined by the nitrogen and chlorine nutrition of coconut (measured in the leaves), respectively.

This trend strongly suggests a positive moderate to strong residual effects of rehab fertilization (average -27% copra yield reduction only after rehab period). Therefore, even without fertilization with the ensuing 2 years after rehab, both nut and copra yields could at least be 100% of the initial yield prior to rehabilitation.

Finally, due to the confirmed residual effects of coconut observed during the post-rehab period with practically no mineral fertilizer application at all), even with the -23% and -27% reduction in nut and copra yield, respectively after coconut rehabilitation by fertilization, the average nut yield of 70 nuts/tree and 2.21 t copra/hectare (annually) an estimated net return of at least P18,500/hectare from coconut production alone could still be achieved. With the intercropping of proper marketable and high-value intercrops and other coconut-based farm products, an additional net profit of at least P35,000 could be generated annually, providing a maximum economic income by at least P53,500 per year from a hectare-coconut farm.

Better still, if the nutrient-rich coconut husk and/or coir dust (cocopeat) could be returned back to the field as natural or organic fertilizer and soil conditioner to enhance soil productivity, crop yield at high levels would be sustained.

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**Table 1. Annual and Total Fertilizer Rates (4 years) by Province, SCFDP**

Province/City	Project Year (PY)	Fertilizers (kg/tree/year) *				
		AS	KCl	NaCl	SP	Dol
CAVITE	1	1.50	2.00	-	-	-
	2	1.50	2.00	-	-	-
	3	1.50	2.00	-	-	1.50
	4	1.25	1.00	0.75	-	1.50
	Total	5.75	7.00	0.75	0.00	3.00
QUEZON	1	1.50	2.00	-	-	-
	2	1.50	2.00	-	-	-
	3	1.50	2.00	-	1.00	-
	4	1.50	1.75	0.75	0.75	-
	Total	6.00	7.75	0.75	1.75	0.00
BATANGAS	1	1.50	2.00	-	-	-
	2	1.50	2.00	-	-	-
	3	1.50	2.00	-	-	-
	4	1.50	1.00	0.75	-	1.50
	Total	6.00	7.00	0.75	0.00	1.50
LAGUNA	1	1.50	2.00	-	-	-
	2	1.50	2.00	-	-	-
	3	1.50	2.00	-	-	-
	4	1.50	2.00	-	-	-
	Total	6.00	8.00	0.00	0.00	0.00
LEYTE	1	1.50	2.00	-	-	-
	2	1.50	2.00	-	-	-
	3	1.50	2.00	-	-	-
	4	1.50	1.00	0.50	-	-
	Total	6.00	7.00	0.50	0.00	0.00
ZAMBOANGA CITY	1	1.50	2.00	-	-	-
	2	1.50	2.00	-	-	-
	3	1.50	2.00	-	1.00	-
	4	1.25	2.00	1.00	1.00	-
	Total	5.75	8.00	1.00	2.00	0.00
DAVAO CITY	1	1.50	2.00	-	-	-
	2	1.50	-	2.00	-	-
	3	1.50	2.00	-	-	-
	4	1.50	1.50	1.75	-	-
	Total	6.00	5.50	3.75	0.00	0.00
DAVAO NORTE & COMPOSTELA	1	1.50	2.00	-	-	-
	2	1.50	-	2.00	-	-
	3	1.50	2.00	-	1.00	-
	4	1.50	1.00	1.00	1.00	-
	Total	6.00	5.00	3.00	2.00	0.00

\* AS (21-0-0); KCl (0-0-60); NaCl (common salt); SP (0-20-0); DOL (dolomite limestone, CaMgCO<sub>3</sub>)

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**Table 2. Residual Effects (Post-Rehabilitation Response) of Selected SCFDP Farms on Nut Yield in the Three Coconut Regions (Seven Provinces and Davao City), Philippines**

Region/Province/City	Average Nut Yield (per tree/year)				Years of Post-Rehab
	Benchmark (1991)	1995 <sup>2</sup> Rehab		1998 <sup>3</sup> Post-Rehab	
<b><u>Southern Tagalog Region (IV-A, IV-B)</u></b>					
Cavite (14 farms)	37	94	(+ 154%)	90 (- 4%)	2
Quezon (10 farms)	35	95	(+ 171%)	58 (- 39%)	2
Batangas & Laguna (5 farms)	52	116	(+ 123%)	80 (- 31%)	2
Average of <b>Good Farms</b> <sup>1</sup>	39	98	(+ 151%)	84 (- 14%)	2
<b><u>Eastern Visayas Region (VIII)</u></b>					
Leyte I (16 farms)	31	55	(+ 77%)	61 (+ 11%)	2
Average of <b>Good Farms</b> <sup>1</sup>	31	65	(+ 109%)	73 (+ 12%)	2
<b><u>Southern Mindanao Region (XI)</u></b>					
Davao City (4 farms)	41	111	(+ 152%)	108 (- 9%)	3
Davao Norte & Compostela (14 farms)	42	97	(+ 126%)	66 (- 32%)	2
Average of <b>Good Farms</b> <sup>1</sup>	43	101	(+ 135%)	92 (- 6%)	2
<b><u>Western Mindanao Region (IX)</u></b>					
Zamboanga City (16 farms)	20	70	(+ 250%)	27 (- 61%)	2
Average of <b>Good Farms</b> <sup>1</sup>	20	77	(+ 285%)	64 (- 17%)	2
<b>General Average (79 farms)</b>	35	91	(+ 160%)	70 (- 23%)	

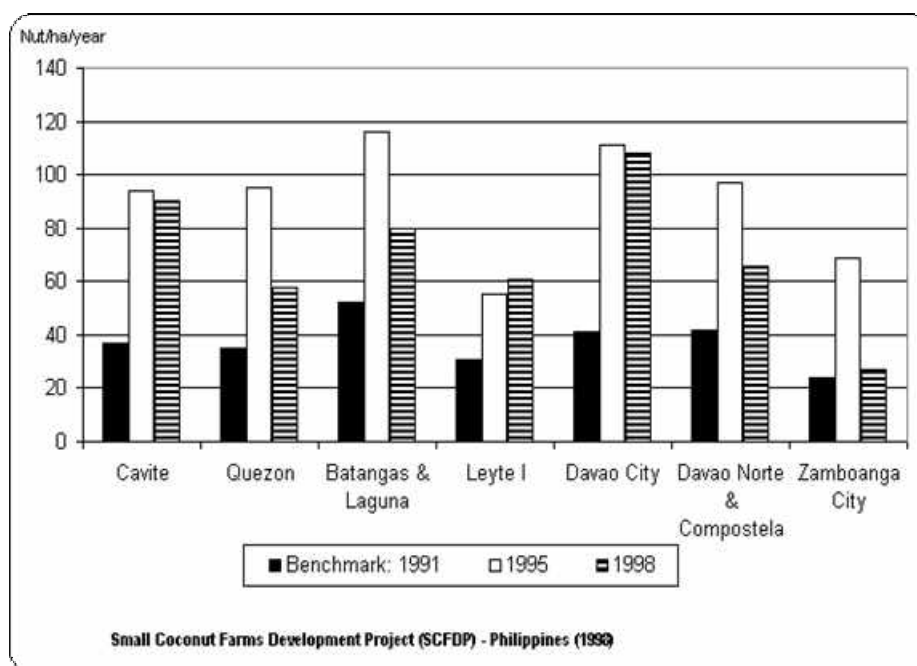
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**Table 3. Residual Effects (Post-Rehab Response) of Selected SCFDP Farms on Copra Yield in the Three Coconut Regions (Seven Provinces and Davao City), Philippines**

Region/Province/City	Average Copra Yield (t copra/ha)				Years of Post-Rehab
	Benchmark (1991)	1995 <sup>2</sup> Rehab		1998 <sup>3</sup> Post-Rehab	
<b><u>Southern Tagalog Region (IV-A, IV-B)</u></b>					
Cavite (14 farms)	0.88	2.59	(+ 194%)	2.63 (+ 1.5%)	2
Quezon (10 farms)	1.26	3.79	(+ 200%)	2.37 (- 37%)	2
Batangas & Laguna (5 farms)	1.57	3.85	(+ 145%)	2.42 (- 37%)	2
Average of <b>Good Farms</b> <sup>1</sup>	2.30	3.27	(+ 42%)	2.59 (- 20%)	
<b><u>Eastern Visayas Region (VIII)</u></b>					
Leyte I (16 farms)	1.10	2.17	(+ 97%)	2.20 (+ 2%)	2-3
Average of <b>Good Farms</b> <sup>1</sup>	1.10	2.17	(+ 97%)	2.43 (+ 12%)	
<b><u>Southern Mindanao Region (XI)</u></b>					
Davao City (4 farms)	1.04	3.40	(+ 227%)	3.10 (- 7%)	3
Davao Norte & Compostela (14 farms)	0.98	3.21	(+ 227%)	2.01 (- 37%)	2-4
Average of <b>Good Farms</b> <sup>1</sup>	0.96	3.26	(+ 239%)	2.76 (- 15%)	
<b><u>Western Mindanao Region (IX)</u></b>					
Zamboanga City (16 farms)	0.57	2.05	(+ 260%)	0.74 (- 64%)	1-3
Average of <b>Good Farms</b> <sup>1</sup>	0.57	2.23	(+ 291%)	2.14 (- 4%)	2
<b>General Average (79 farms)</b>	0.94	3.01	(+ 220%)	2.21 (- 27%)	2

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Figure 1. Rehabilitation-Fertilization Residual Effects in Selected SCFDP Farms on Nut Yield\* (Post-Rehab Response)



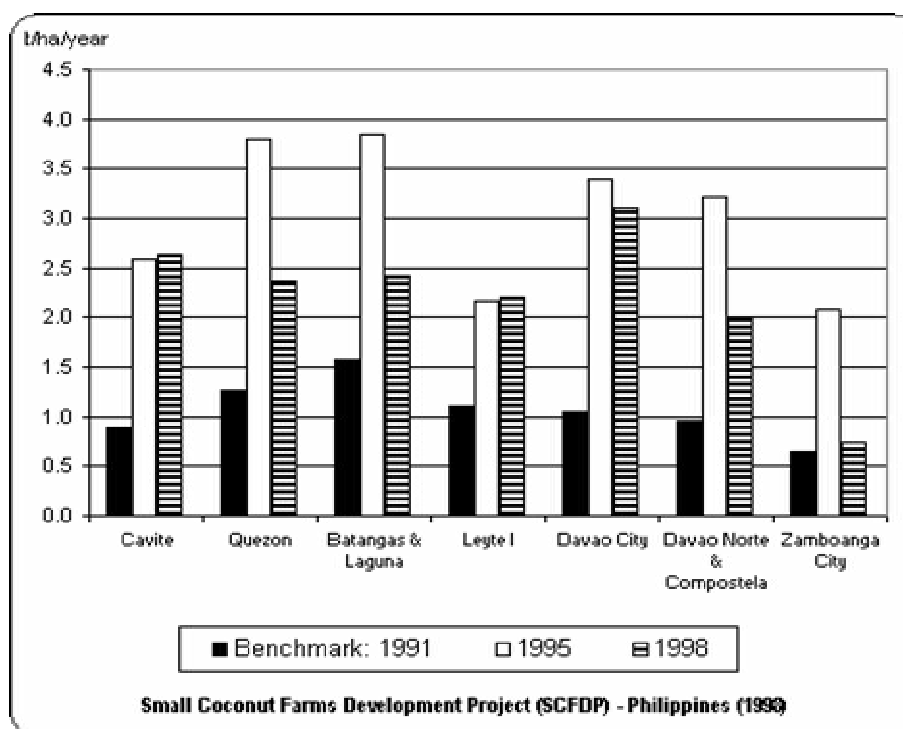
Region/Province/City	Nut Yield (per tree/year)		
	Benchmark (1991)	1995 Rehab	1998 Post-Rehab
<b><u>Southern Tagalog Region (IV-A, IV-B)</u></b>			
Cavite (14 farms)	37	94	90
Quezon (10 farms)	35	95	58
Batangas & Laguna (5 farms)	52	116	80
<b><u>Eastern Visayas Region (VIII)</u></b>			
Leyte I (16 farms)	31	55	61
<b><u>Southern Mindanao Region (XI)</u></b>			
Davao City (4 farms)	41	111	108
Davao Norte & Compostela (14 farms)	42	97	66
<b><u>Western Mindanao (IX)</u></b>			
Zamboanga City (16 farms)	24	69	27
<b>General Average (79 farms)</b>	<b>35</b>	<b>91</b> <b>(+160%)</b>	<b>70</b> <b>(-23%)</b>

\* with annex table below

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Figure 2. Rehabilitation-Fertilization Residual Effects in Selected SCFDP Farms on Copra Yield\* (Post-Rehab Response)



Region/Province/City	Copra Yield (t copra/ha)		
	Benchmark (1991)	1995 Rehab	1998 Post-Rehab
<b><u>Southern Tagalog Region (IV-A, IV-B)</u></b>			
Cavite (14 farms)	0.88	2.59	2.63
Quezon (10 farms)	1.26	3.79	2.37
Batangas & Laguna (5 farms)	1.57	3.85	2.42
<b><u>Eastern Visayas Region (VIII)</u></b>			
Leyte I (16 farms)	1.10	2.17	2.20
<b><u>Southern Mindanao Region (XI)</u></b>			
Davao City (4 farms)	1.04	3.40	3.10
Davao Norte & Compostela (14 farms)	0.96	3.21	2.01
<b><u>Western Mindanao (IX)</u></b>			
Zamboanga City (16 farms)	0.65	2.07	0.74
<b>General Average (79 farms)</b>	<b>0.94</b>	<b>3.01 (+220%)</b>	<b>2.21 (-27%)</b>

\* with annex table below

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**Annex Table 1. SUMMARY OF ESTIMATED YIELDS: Benchmark, Year 1995 and 1998 (selected SCFDP Farms)  
Southern Tagalog Region (Provinces of Cavite, Quezon Batangas and Laguna), Luzon**

Location/Farm	Intercrop	Year of Last Fertilizer Application <sup>1</sup>	Nut Yield (per tree/year)			Copra (t/ha/year)*			Years of Post-Rehab
			Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	
<b><u>Cavite</u></b>									
1. Urdaneta, Magallanes/L. Rugador	-	'95	34	97	91	0.65	2.15	1.80	2
2. Urdaneta, Magallanes/J. Abellada	MC	'95	40	115	106	1.17	3.17	4.10	2
3. Kabulusan, Magallanes/E. Pagcaliwagan	MC	'95	58	102	93	1.50	2.98	2.90	2
4. Kaytitinga, Alfonso/F. Del Mundo	MC	'95	38	73	87	0.80	1.73	2.20	2
5. Kaytitinga, Alfonso/T. Mojica	MC	'95	27	77	92	0.63	2.25	2.90	2
6. Castaños-Layos/Aguinaldo/J. Bautista	MC	'95	42	85	72	0.88	2.15	2.10	2
7. Castaños-Layos/Aguinaldo/V. Lopez	MC	'95	35	89	108	0.91	2.78	3.40	2
8. Tambo-Balagbag/Indang/C. Pagtalunan	MC	'94	26	81	78	0.61	2.40	2.80	3
9. Tambo-Balagbag/Indang/M. Mojica	MC	'95	28	80	59	0.65	2.34	1.80	2
10. Lumampong-Halayhay/Indang/I. Digma	MC	'95	32	85	84	0.75	2.65	2.20	2
11. Lumampong-Halayhay/Indang/R. Pana	MC	'95	45	89	89	1.06	2.60	2.80	2
12. Kaong, Silang/C. Miranda	MC	'94	31	135	96	0.72	3.51	2.50	3
13. Kaong, Silang/R. Gana	MC	'95	39	124	101	0.91	3.22	2.50	2
14. Balite, Silang/M. Capaya	MC	'95	44	81	107	1.03	2.36	2.80	2
Range			27-58	73-135	78-107	0.63-1.50	1.73-3.51	1.80-4.10	2-3
Average			37	94	90	0.88	2.59	2.63	2
<b><u>Quezon</u></b>									
1. Ilayang-Talim, Lucena City/C. Ranuda	-	'96	40	92	48	1.71	4.70	2.00	1
2. Ilayang-Talim, Lucena City/B. Mabuhay	Banana & Guava	'96	28	76	51	1.20	3.68	2.60	1
3. Marquez, Padre Burgos/E. Salazar	-	'95	48	102	57	2.06	4.95	3.00	2
4. Hinguin, Padre Burgos/V. Habrica	-	'95	34	77	45	0.88	2.25	1.50	2
5. Palsabangon, Pagbilao/S. Pornobe	-	'95	28	87	41	0.92	3.23	1.30	2
6. Bukal Sur, Candelaria/L. Manalo	-	'95	36	100	62	1.18	3.70	2.40	2
7. Bukal Sur, Candelaria/V. Escalona	-	'95	30	99	60	0.99	3.66	2.40	2

8. Antonio, Dolores/R. Ronquilla	-	'94	36	118	75	1.18	4.37	2.80	3
9. Antonio, Dolores/R. Bombani	-	'95	40	97	64	1.31	3.50	2.00	2
10. Talisay, Tiaong/C. Rivera	-	'95	34	104	76	1.12	3.85	3.70	2
Range			28-48	76-118	41-76	0.88-2.06	2.25-4.95	1.30-3.70	1-3
Average			35	95	58	1.26	3.79	2.37	2
<b>Batangas and Laguna</b>									
1. Talaga, Tanuan, Batangas/L. Opeña	-	95	43	81	78	1.40	2.99	2.60	2
2. Banga, Talisay, Batangas/E. Luna	-	95	37	75	72	0.96	2.30	2.30	2
3. San Ildefonso, Alaminos, Laguna/J. Cachero	Lanzones & Fruits	95	50	114	79	1.48	3.55	2.10	2
4. San Rafael, San Pablo City, Laguna/A. Francisco	Lanzones & Fruits	96	45	170	76	1.48	6.29	2.50	1
5. Paliparan, Caluan, Laguna/D. Cueto	Lanzones & Fruits	95	86	139	93	2.54	4.10	2.60	2
Range			37-86	75-170	72-93	0.96-2.54	2.30-6.29	2.10-2.60	1-2
Average			52	116	80	1.57	3.85	2.42	2
<b>Regional Average</b>			<b>42</b>	<b>102</b>	<b>76</b>	<b>1.23</b>	<b>3.41</b>	<b>2.47</b>	<b>2</b>
Average - <b>Good Farms</b> ( $\geq 60$ nuts/tree or $\geq 1.75$ t copra/ha)			<b>39</b>	<b>98</b>	<b>84</b>	<b>2.30</b>	<b>3.27</b>	<b>2.59</b>	<b>2</b>

<sup>2</sup> May/1995

<sup>3</sup> May/1998

MC - mix cropping (banana, pineapple, coffee, cacao, corn, cassava, guava, citrus, mango)

\* Farm-specific planting density (117-194 trees/ha) adjusted (5% less theoretical), refer to PJCS 19(1).

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**Annex Table 2. SUMMARY OF ESTIMATED YIELDS: Benchmark, Year 1995 and 1998 (selected SCFDP Farms)  
Region VIII (Leyte I)**

Location/Farm	Intercrop	Year of Last Fertilizer Application <sup>1</sup>	Nut Yield (per tree/year)			Copra (t/ha/year)*			Years of Post-Rehab
			Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	
<b><u>Leyte I</u></b>									
1. Cabuyuan, Tanuan/Arturo Alacer	-	95	38	48	54	1.14	1.80	2.02	2
2. Pago, Tanuan/Jesus Almadin	-	95	30	71	69	0.82	1.89	2.27	2
3. Salvador, Tanuan/Lucia Arcena	Abaca, Banana	95	27	61	98	1.00	2.40	3.22	2
4. Quilao, Tolosa/Manuel Yaras	-	95	24	48	38	0.60	2.01	1.42	2
5. Calubian, Dulog/Roman Duqueza	-	95	27	49	69	1.30	2.60	3.05	2
6. Calubian, Dulog/Buenaventura Cinco	-	95	41	55	42	1.50	2.50	1.48	2
7. Dacay, Dulag/Apolonia Malate	-	95	24	54	67	1.20	3.05	3.52	2
8. Tigbao, Dulog/Dominador Lasadio	-	94	6	45	49	0.26	2.30	2.16	3
9. Bolongtohan, Dulag/Primitivo Cayundong	-	95	36	54	29	1.05	1.79	0.74	2
10. Bolongtohan, Dulag/Jose Arguta	Banana	95	26	50	63	0.96	1.98	2.07	2
11. Cansamada, Dagami/Andres Alpino	-	95	45	57	66	1.26	1.90	1.93	2
12. Digahunan, Dagami/Epifanio Salve	-	94	36	56	65	1.60	1.75	1.89	3
13. Cansamada, Dagami/Romeo Verbo	-	95	41	64	78	1.50	2.50	2.70	2
14. Hinulogan, Dagami/Ana May Lamamigo	-	95	19	59	86	0.55	2.00	2.36	2
15. Guinarona, Dagami/Liduvina Palacol	-	92	52	57	57	1.92	2.25	2.41	5
16. Digahunan, Dagami/Rosita Gernale	-	94	24	47	52	0.90	1.98	1.94	3
Range			<b>6-52</b>	<b>45-71</b>	<b>29-98</b>	<b>0.26-1.92</b>	<b>1.75-3.05</b>	<b>1.42-3.52</b>	<b>2-5</b>
Regional Average			<b>31</b>	<b>55</b>	<b>61</b>	<b>1.10</b>	<b>2.17</b>	<b>2.20</b>	<b>2</b>
Average - <b>Good Farms</b> (≥ 60 nuts/tree or ≥ 1.75 t copra/ha)			<b>31</b>	<b>65</b>	<b>73</b>	<b>1.10</b>	<b>2.17</b>	<b>2.43</b>	<b>2</b>

<sup>1</sup> AS + KCI + SP    <sup>2</sup> May/1995 - affected by strong Typhoon 'Garding', Dec/94    <sup>3</sup> May/1998

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\* farm-specific planting density (110-198 trees/ha) adjusted (5% less theoretical), refer to PJCS 19(1).

**Annex Table 3. SUMMARY OF ESTIMATED YIELDS: Benchmark, Year 1995 and 1998 (selected SCFDP Farms)  
Region XI (Davao City and Davao Norte)**

Location/Farm	Intercrop	Year of Last Fertilizer Application <sup>1</sup>	Nut Yield (per tree/year)			Copra (t/ha/year)**			Years of Post-Rehab
			Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	
<b><u>Davao City</u></b>									
1. Poblacion, Baguio Dist./Fedela Escalera	Gmelina tree	'94	44	105	152	0.90	3.50	4.46	3
2. Malagos, Baguio Dist./Mauro Caro	Cacao	'94	38	110	109	0.76	3.23	3.19	3
3. Subasta, Calinan/Cesar Omo	Banana, Coffee	'94	44	115	83	1.50	3.58	2.42	3
4. Riverside, Calinan/Onofre, Jamotillo		'94	38	112	89	0.98	3.27	2.32	3
Range			38-44	105-115	83-152	0.76-0.98	3.23-3.58	2.32-4.46	
Average			41	111	108	1.04	3.40	3.10	
<b><u>Davao Norte/Compostela Valley</u></b>									
5. Maynaga, Tabon-tabon/Pantukan/Nory Lamera*	?	'95	29	88	51	0.85	2.94	1.58	2
6. Lahi, Maynaga, Pantukan/Proceso Oczon*	-	'95	40	82	50	0.80	3.20	1.47	2
7. Del Pilar, Mabini/Margarito Said	-	'95	55	116	73	1.30	3.87	1.89	2
8. Cabayoan, Mabini/Antonia Salado	-	'95	37	62	58	0.93	1.81	1.50	2
9. Lapu-Lapu, Maco/Romeo Taojo****	-	'95	44	98	92	1.10	2.86	3.30	2
10. San Isidro, Tagum/Jesus Jumawan***	?	'95	50	110	67	1.30	3.86	1.73	2
11. Asuncion, Carmen/Prisco Abenion***	-	'94	45	130	49	0.96	3.38	1.42	3
12. Quezon, Panabo/Cepriano Cabardo	-	'93	42	80	57	1.00	3.67	1.91	4
13. Quezon, Panabo/Lolita Telmo	-	'94	50	110	64	0.80	3.27	2.14	3
14. Nanyo, Panabo/Elias Caro****	Guava	'93	42	98	95	0.80	3.22	3.17	4
Range			29-55	62-130	49-95	0.80-1.30	1.81-3.68	1.42-3.30	2-4
Average			43	97	66	0.98	3.21	2.01	2
<b>Regional Average</b>			<b>42</b>	<b>104</b>	<b>87</b>	<b>1.01</b>	<b>3.30</b>	<b>2.55</b>	<b>2</b>
Average - <b>Good Farms</b> ( $\geq 60$ nuts/tree or $\geq 1.75$ t copra/ha)			<b>43</b>	<b>101</b>	<b>92</b>	<b>0.96</b>	<b>3.26</b>	<b>2.76</b>	<b>2</b>

\* hit by "El Niño"

\*\* @ 117 trees/ha (adjusted planting density)

\*\*\* mulching with organic farm wastes practiced

\*\*\*\* fertilized guava intercrop plus cover-cropping

<sup>1</sup> AS + KCl + NaCl

<sup>2</sup> May/1995

<sup>3</sup> May/1998

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**Annex Table 4. SUMMARY OF ESTIMATED YIELDS: Benchmark, Year 1995 and 1998 (selected SCFDP Farms)  
Western Mindanao Region, Zamboanga City (16 farms)**

Location/Farm	Intercrop	Year of Last Fertilizer Application <sup>1</sup>	Nut Yield (per tree/year)			Copra (t/ha/year)*			Years of Post-Rehab
			Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	Benchmark (1991)	1995 <sup>2</sup>	1998 <sup>3</sup>	
1. Patalon, Zamboanga City/B. Bustamante	-	'94	24	55	50	0.80	1.84	1.46	1
2. Sinubong, Zamboanga City/B. Garcia	-	'96	23	75	16	0.77	2.51	0.42	1
3. Simbong, Zamboanga City/N. Sierra	-	'94	20	60	11	0.60	1.75	0.25	3
4. Simbong, Zamboanga City/R. Soler	-	'94	22	55	13	0.64	1.61	0.34	3
5. La Paz, Zamboanga City/L. Adorable	-	'95	25	70	31	0.73	2.05	0.73	2
6. Talisayan, Zamboanga City/C. Salve	-	'94	25	80	13	0.73	2.67	0.32	3
7. Talisayan, Zamboanga City/M. Fajardo	-	'94	21	80	16	0.61	2.34	0.38	3
8. Sinunuc, Zamboanga City/P. Ledesma	-	'95	22	75	43	0.64	2.20	1.00	2
9. Maasin, Zamboanga City/A. Buscas	-	'95	25	58	7	0.75	1.70	0.17	2
10. Ayala, Zamboanga City/F. Coronel	-	'95	29	70	64	0.85	2.05	1.66	2
11. Talabaon, Zamboanga City/S. Duqueza	-	'96	27	73	27	0.79	2.13	0.64	1
12. Lumbangan, Zamboanga City/M. Acejas	-	'96	23	50	29	0.67	1.46	0.68	1
13. Patalon, Zamboanga City/A. Monongsong	-	'96	7	48	55	0.15	1.25	2.14	1
14. La Paz, Zamboanga City/J. Del Mundo	-	'95	6	68	17	0.14	1.99	0.46	2
15. Maasin, Zamboanga City/A. Buscas	-	'95	6	90	20	0.14	2.34	0.53	2
16. Guisao, Zamboanga City/T. Arquiza	-	'95	7	110	27	0.15	2.86	0.62	2
Range			6-29	48-100	7-64	0.14-0.85	1.46-2.86	0.25-2.14	1-3
Average			24	69	27	0.65	2.05	0.74	2
Average - <b>Good Farms</b> (≥ 60 nuts/tree or ≥ 1.75 t copra/ha)			20	77	64	-	2.23	2.14	2

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