PHILIPPINE COCONUT AUTHORITY
First Semester 2007
Accomplishment Report

First Semester 2007 was a challenging period in the implementation of the Coconut Industry Road Map due to the dampening effect of the series of super typhoons in the preceding year. Counter measures undertaken included the PCA regular programs of production support, market development, extension, regulatory enforcement, institution building and R&D among others. The continued development of 1.35 million hectares of underutilized coconut lands was pursued for agri-business purposes.

Although a planting and fertilization program is underway to meet the incremental requirements of the fast growing virgin coconut oil, coir products and bio-fuel sectors, the typhoon damaged areas necessitate hunger mitigation measures in the form of principally corn intercropping as a cash crop for our hard pressed coconut farmer families in the typhoon devastated regions. Technical and extension assistance is via the prescription and formulation of combined organic and inorganic fertilizers and plowing in interspaces to enrich the soil for coconut and intercrops.

In the international market, product standards are being continually upgraded through the Trade Related Technical Assistance (TRTA) program to promote global competitiveness and compliance.

Millgate prices and export volume were greatly affected in the first semester of the year with average millgate price at P25.33 per kilogram, up by 49% from the P17.10 per kilogram in the same period last year. Coconut export volume registered a sharply reduced 563,910 MT (available January-May 2007 period) in the reference period, down by almost 50% from the 1.0 million MT (January-May 2006 period) export volume in previous year. Export price of CNO averaged US$823 per MT in the period. Being export driven, the industry continues to be heavily dependent on the export market at 80% of annual production mainly as crude coconut oil, while the remaining 20% is domestically consumed. With the majority of coconut production converted to CNO, the prices of coconut-based local products are price dependent on CNO.

The record of the coconut sector as an agro-industrial pillar is a confirmation of the development options adopted which have over the long term contributed to the stable performance of the sector. The industry continues to be a significant player in the national economy, with 324 million bearing trees spread over 3.26 million hectares in 68 provinces supporting the lives of 25 million Filipinos in the production, trading and processing sector.

As steward of the production sector, the PCA continues to ensure the availability of raw materials in the farm level for eventual product development and value-adding. A medium term focus of the Authority is to expand the supply base by at least doubling the current coconut production from 2.0 million MT to 4.0 million MT yearly to address the incremental needs of emerging coconut sectors. The coconut industry faces supply problems in the medium term unless a supply reliability and funding availability programs are put in place.

In the aggregate, coconut continues to perform a herculean task in shaping national development with the industry providing a diversified income source for majority of Filipinos by way of direct and indirect employment generation.

Highlights of accomplishment during the First Semester 2007 are as follows:

1. Production Support Services

1.1 Coconut Agribusiness Land Development Program (Goal 1)

Main objectives of this PCA strategic program include a) increasing the income of the coconut farmers from P13,000/ha to P150,000/ha by 2010; b) generate additional 1-3 jobs per hectare; and c) increase coconut productivity from the existing 638 kilograms/ha to 2,000 kilograms/ha by 2010. In the reference period, 50,606 hectares were developed and 57,704 jobs were generated under this component.

1.1.1 Planting/Replanting

To counteract the decline due to massive cutting, land conversion and palm senility, a total of 16,674 hectares were planted/replanted. Number of jobs generated reached 18,932.

1.1.2 Intercropping/Diversification

A. Crops

This component is aimed to maximize income generation of farmer-cooperators by the planting of suitable intercrops. Area intercropped totalled 26,453 hectares with approximately 4.238 million planting materials distributed benefitting 36,783 farmers. Number of jobs generated reached 34,230.

1.1.3 Rehabilitation thru Fertilization

To improve the soil nutrition in coconut farms, 7,479 hectares with a total coconut tree inventory of 606,317 trees were fertilized benefitting 5,296 farmers. Number of jobs generated amounted to 4,542.

1.2 Seedfarm Establishment

This component is intended to ensure availability of good quality seedlings primarily for replacing trees cut under RA 8048. A total of 50 hectares were developed with 5,000 seedlings planted in strategic areas.

1.3 Oil Palm Planting/Replanting

Development of oil palm industry is focused more on its complementation rather that competition with the coconut industry. During the reference period, 166,264 seedlings were distributed in 1,294 hectares benefitting 299 farmers.

1.4 Accelerated Hunger Mitigation Program

This program is aimed to provide a cash crop for hard pressed coconut farmers nationwide. The program's advantages over mere fertilization are a) intercropping costs are lower; and b) deep plowing within coconut interspaces will increase yield. For the first semester 2007, 115,396 hectares were intercropped generating 114,811 jobs in strategic areas nationwide.

2 Market Development Services

2.1 Direct Copra Marketing Assistance Program

To directly link coconut farmers to oil mills and obtain higher copra prices and eliminate middlemen who absorb an average 25% of the copra price, cooperative business units (CBUs) are continually being established. In the reference period, 79 CBUs with 20,764 members were benefitted.

2.2 Investment/Trade Promotions

It is the Authority's mandate to promote trade and investment in the coconut sector. Along this line, the PCA participated in 17 local trade fairs and conducted 8 trade fairs during the period in review. Participation in trade fairs have resulted in the actual buying and orders of coconut products and created general awareness on the existence of various coconut products.

2.3 Copra Quality Improvement Program under EU-TRTA Assistance

Implementation of this project include the installation of 11 copra dryers and 3 trainings conducted with 175 farmer-beneficiaries.

3. Credit Facilitation Services

3.1 Micro Finance and Credit

This component is aimed at providing working capital for livelihood projects and enhance entrepreneurial skills of coconut farmers and farmworkers. During the reference period, 187 cooperatives were granted loan assistance in the amount of P30.931 Million benefitting 8,996 farmer-beneficiaries.

4. Irrigation Development Services

4.1 Farm Mechanization (Small Scale Irrigation Project)

A major aspect in improving yield is the availability of irrigation. On the production side, ample supply of water is imperative not only for coconut but for intercrops and livestock as well. During the period, 26 shallow tube wells (STWs) were installed covering 217 hectares and benefitting 253 farmer-cooperators.

5. Other infrastructure and/or Post-Harvest Development Services

5.1 Copra Quality Improvement

The poor quality of Philippine copra has long been a burden to the trade of copra, copra meal and crude coconut oil, both in the local and foreign markets. In order to arrest the problem, 52 copra dryers are installed and 1 moisture meter distributed, benefitting 362 farmer-beneficiaries.

6. Extension Support, Education and Training Services

6.1 Training on Coconut Farming & Processing Technologies & Institution Building

The Authority recognizes the importance of skills- training to ensure continued capability and business development. For the period, 776 trainings were conducted with 19,279 farmers trained.

6.2 Extension Services

Extension is one of the Authority's core activities, through which various technical knowledge and services are delivered at the farm level. For the first semester of the year, 37,111 farm visits were made with 61,060 farmers served. On the other hand, 845 techno-demo sessions were held attended by 11,202 farmers. Under the aspect of information dissemination, 1,324 extension materials were distributed with 55 press releases/briefings and radio/TV plug-ins.

7. Research and Development

7.1 Varietal Improvement

This component is geared towards development and maintenance of existing and new hybrid varieties of seednuts originated from various dwarfs and tall populations. Involving researches on breeding and genetics, tissue culture and biotechnology, there were eleven (11) on-going research projects during the period.

7.2 Crop Agronomy, Nutrition and Farming Systems

Involving continues studies on mineral nutrition, integrated soil fertility management under coconut-based farming systems and sustainable cropping patterns, there were seventeen (17) on-going research projects during the period.

7.3 Integrated Crop Protection

Concerned with the development studies of integrated pest management strategies for the control of coconut pests, weed management and utilization of botanical biocides, there were six (6) on-going research projects during the period.

7.4 Bio-Fuel Development

Focused on promoting coco methyl ester as fuel quality enhancer and alternative to traditional petro diesel, PCA is a partner in the development of the Philippine Coconut Bio-Diesel Program. Since project inception in 2001 to February 2007, there are currently seven (7) main bio-diesel producers with a current rated combined manufacturing capacity of around 205,300 MT (205.3 million liters) of coco bio-diesel.

7.5 Seednut/Seedling Production

Geared towards ensuring availability of planting materials, a total of 489,010 seednuts were produced, of which 106,603 seednuts were distributed.

7.6 Makapuno Commercialization

In the effort to commercialize the production of makapuno, the PCA continues to produce and distribute superior quality makapuno seednuts and seedlings. Embryo-cultured makapuno (ECM) seedling produced reached 700 while 90 seedlings were distributed/sold.

7.7 Integrated Pest Management

A part of the IPM program of the PCA is the containment of rhinoceros beetle infestation. Along this line, 2,025 hectares were covered benefitting 2,415 farmer-cooperators.

7.8 Brontispa Eradication Program

Brontispa is a flat insect dwelling inside unopened young palm leaves and scrape coconut leaf surfaces which eventually destroys the capacity of the leaves to undergo photosynthesis needed for the growth of coconut. Since discovery of Brontispa in coco ornamental palms in April 2005, the pest now infects 14 provinces in Luzon, 1 in the Visayas and 3 in Mindanao (18 out the 79 coconut provinces).

Initial reports (from Region IV-A & X) reveal that 12,044 coconut trees were infested with 5,776 trees treated. Coconut area affected reached 471.3 hectares affecting 209 farmers and 420 households.

8. Regulatory Services

8.1 Registration

As a means to generate income and monitor the entry of entrepreneurs in the coconut sector, the Authority requires the registration of all coconut-based entities with adherence to set requirements. During the period, 77 coconut manufacturers/processors and 6,712 traders were processed and registered.

8.2 RA 8048

This legislation is to ensure that only coconut trees eligible for cutting are actually processed into lumber. The implementation of RA 8048 covered the issuance of 5,361 permits.

8.3 Land Conversion

During the period, there were 44 Certificates of Inspection and Verification (CIV) issued.

9. Information Support Services

This component involves the upkeep and maintenance of IT facility, updating of information and data system, uploading/updating of PCA web page and the development of statistical reports for usage/distribution/ready reference to interested parties both public and private. During the period, the PCA Central Office Local Area Network is continuously maintained and operationalized while the PCA website (including the Coconut Farmers Agribusiness Center or CFAC webpage) is regularly uploaded/updated.

10. Policy Formulation, Planning and Advocacy

This component involves the preparation of policy agenda and recommendations, PCA Strategic Plan, updated PCA and Coconut Industry Profile and the Quarterly, Semestral and Annual Accomplishment Reports of the Authority and the Industry.

11. Farm Services

11.1 Farmers Organization and Cooperatives

11.1.1 Newly Organized

The Authority recognizes the importance of organizing coconut farmers into cooperatives not only to attain economies of scale in production and in processing but attain higher prices and less cost in copra trading as well. During the period, the PCA facilitated the formation of 27 cooperatives with 587 members and assisted 93 farmers organization with 2,510 members.

11.1.2 Strengthening of Existing CFOs/Coops

Expansion of cooperatives is a necessity in the drive towards empowerment of coconut farmers. In short, this component is to strengthen existing cooperatives through membership expansion training. For the period, 466 cooperatives were assisted with 28,882 new members. Further, 1,684 farmer organizations with 46,437 members were assisted through the conduct of trainings.

11.2 Farmers Data Bank

There is a continuing need to update the PCA farmers data bank for planning, monitoring and program delivery services. A total of 3,929 farmers were profiled while encoding of the farmer's profile during the period reached 8,941.

11.3 Upgraded Insurance

As a form of extending benefits to coconut farmers, the PCA continues to provide higher insurance coverage to coconut farmers in cooperation with COCOLIFE. Involving the enlistment, upgrading and distribution of insurance policies to coconut farmers. During the semester, 421 farmers were enlisted, 12 policies distributed while 2,558 claimants were assisted.

Vital Impact on the Economy

The series of super typhoons in the preceding year contributed significantly to the decline in coconut production and consequent parallel decline in exports in first semester 2007.

General exports of coconut products (with the exception of VCO, coco-chemicals, CME and select non-traditionals) are on the downtrend due to the limited copra supply. Coconut exports fell from 606,656 MT in first semester 2006 to 314,188 MT in the same period of 2007 or a decline of almost 50%. As a result, prices of by-products during the semester in review are generally higher from the preceding year level with average domestic prices of copra at P25.33 per kilogram, refined coconut oil at P46.12 per kilogram, copra meal at P8..76 per kilogram, DCN at P2,072.12 per 100-lb bag, husked nuts at P6,544.13 per MT and coco-shell charcoal at P6,571.48 per MT.

With year 2005 as baseline, the country's shortfall in coconut production to meet the domestic and export markets is pegged at 500,000 MT. Inspite of this, demand for coconut in general remains high with a special demand for biofuel and healthier vegetable oils. Non-traditionals with a rising demand curve include shampoo, nata de coco, glycerin, liquid coconut milk and toilet/bath soap.

To restore the country's coconut production to higher levels, PCA started to implement in June a rehabilitation of typhoon devastated areas via intercropping which will cut costs by P2.0 billion, raise productivity yields and offer rural folk a cash crop. The program seeks to intercrop with corn 100,000 hectares in typhoon devastated areas which will form part of a bigger P2.0 billion national coconut rehabilitation program encompassing 2.0 million hectares.

While coconut production is forecasted to reach only 2.17 million MT for CY 2007, PCA's intercropping strategy is envisioned to raise coco production to the 2.65 million MT level of 2005, in about two to three years. Intercropping in distressed areas of coconut land has numerous advantages over mere fertilization, these are: a) intercropping costs is lower requiring only P1,000 per hectare for the cheaper inbred seed and inoculants in contrast to P5,000 per hectare through regular fertilization; b) deep plowing will be involved not only in corn planting but within the coconut tree interspaces; thus, yield will be higher by around 15% or in absolute terms 1.15 MT per hectare compared to the traditional 1.0 MT per hectare.

As the mainstay of Philippine export agriculture, coconut programs deserve the priority status and all the attention they can obtain from concerned sectors, particularly with respect to rehabilitation support. Sustained coconut growth will lay the groundwork for countryside development that will create more jobs and foreign exchange inflows, thereby significantly reducing poverty in the rural areas and raising rural real income in the years ahead.

REGIONAL AGRIBUSINESS INVESTMENT PROFILE FOR COCONUTS

I. General Information

a) Climate

Coconut is not very exacting in its climatic requirements. But while it tolerates a wide range of climatic conditions, it demands certain environmental standards for optimum growth and high productivity.

b) Soil/Land Resources

Soil is an important consideration in coconut production. Coconut grows best in fertile and adequately-drained soils with a minimum depth of 75cm and with high water-holding capacity (at least 30% clay content). Generally, a wide range of soil textures (sand-clay) is suitable for coconut production.

The palm tolerates soil pH from5.0 to 8.0. For optimum growth, however, a pH range of 5.5 to 6.5 is ideal.

Coconut requires a productive soil that has adequate essential elements such as nitrogen (N), phosphorous (P), potassium (K), calcium (Ca), magnesium (Mg), sodium Na), sulfur (S), chlorine (Cl), iron (Fe), manganese (Mn), zinc (Zn), boron (B), copper (Cu) and molybdenum (Mo). Generally, Philippine soils commonly planted to coconuts have adequate amounts of Na, Ca, Mg, Fe, Mn and Zn but most coastal and inland soils are severely deficient (very low) in N and Cl and inadequate in K, P, S, Mg and B. Such soils definitely require judicious fertilizer application to sustain high yields.

Coconut Growing Zones and Production Suitability of the Crop:

1) Highly Suitable Provinces (Wet)

    a. Polillo Island
    b. Quezon
    c. Camarines Norte
    d. Catandunes
    e. Albay
    f. Sorsogon
    g. Northern Samar
    h. Samar
    i. Eastern Samar
    j. Leyte

k. Southern Leyte
l. Aklan
m. Capiz
n. Surigao Norte
o. Agusan Norte
p. Surigao Sur
q. Agusan Sur
r. Misamis Oriental
s. Misamis Occidental
t. Lanao Norte
u. Lanao Sur
v. Davao
w. Sultan Kudarat
x. Zamboanga Sur
y. Basilan Island
z. Sulu

2) Suitable (Intermediate)

a. Apayao
b. Cagayan
c. Isabela
d. Quirino
e. Laguna
f. Cavite
g. Mindoro Oriental
h. Marinduque
i. Palawan
j. Calamian Group of Islands
k. Camarines Sur
l. Romblon
m. Masbate
n. Antique
o. Iloilo
p. Negros Occidental
q. Cebu
r. Negros Oriental
s. Bohol
t. Zamboanga del Norte
u. Bukidnon
v. North Cotabato
w. Davao Oriental
x. South Cotabato
y. Davao Sur
z. Tawi-tawi Group of Islands

3) Fairly Suitable (Dry)

a. Batanes
b. Ilocos Norte
c. Kalinga
d. Ilocos Sur
e. Benguet
f. La Union
g. Pangasinan
h. Zambales
i. Bataan
j. Mindoro Occidental

4) Not Suitable (mainly lowland rice areas or high altitude areas of 600 meters and above)

a. Abra
b. Mt. Province
c. Ifugao
d. Nueva Vizcaya
e. Nueva Ecija
f. Tarlac
g. Pampanga
h. Bulacan
i. Rizal

Source: Magat, 2001
PCA R&D, December 2001

c) Land Suitability for Coconut Production Based on Rainfall Types (Magat 1977)

Type	Description	Max. no. of dry mos.	Suitability	Areas
A	Wet (rainy)	1.5	Highly Suitable	Luzon (eastern coastal areas) Samar Masbate (Eastern) Mindanao (portions of Eastern, Northern, Southern)

B	Humid (rain evenly distributed)	3.0	Suitable	Luzon (portion of valleys and plains of Northern, Central, Southern).
C	Moist (rain sufficiently distributed)	4.5	Suitable	Panay Leyte (Western) Bohol Mindanao (portions of Central and Western, Eastern) Masbate (Western) Palawan(Eastern,Southwestern) Negros (Northern, Central) Cebu (Eastern, Western portions).
D	Dry (rain not sufficiently distributed)	6.0	Fairly Suitable	Luzon (Southwestern, Central, Northwestern). Palawan (Western) Negros (portions of Southwestern Panay (portions) Mindanao (Western) Cotabato (portions of Southern)
E	Arid	7.5	Fairly Suitable	Luzon (Northwestern) Negros(portion of Southeastern) Cotabato(part of GeneralSantos)
F	Barren (deficient rainfall)	9.0	Unsuitable	Ilocos Norte (certain areas) Mountainous areas (over 600m above sea level).

d). Ideal Growing Conditions for Coconuts (PCA 2002)

Factors	Description
1. Altitude (elevation)	Lower than 500 m above sea level. Above 600 m, palm flowering impaired and bunch production irregular with unstable yields.
2. Rainfall	Total of 1500-2500mm/year, almost uniformly distributed, with at least 125 mm per month. Not more than 3 successive dry months (rainfall less than 50 mm)
3.Relative Humidity	Within 80-90%. A persistently very high humidity favors the spread of fatal fungus diseases, common in very high elevations.
4. Temperature	Annual mean optimum of 27 C and monthly mean of 20 C, with diurnal variation of 5 C-7 C
5. Soil Moisture	Field capacity moisture (within temperature ranged 25 C-40 C) of available moisture of 12-15%. Water-logged conditions lasting for more than 1 week is growth-limiting and yield-reducing.
6. Soil Drainage	Well-drained and aerated at all times. Root respiration impaired and plant physiology abnormal under poor drainage conditions.
7. Sunlight	Above 2000 sunshine hour/year with daily full sunlight (above 4500 ft-candle light intensity). Provides full and stable bunches of the tree crown, year-round;
8. Soil pH	Soil acidity of pH 5.5-6.5
9. Soil Depth	>75 cm (top plus subsoil)
10. Soil Texture	Either sandy, loamy and clayey grades (provided organic matter soil is >2%
11. Soil Fertility	Soil analysis: organic matter >2%: total N 1000-2000 ppm; CEC> 15 meq/100g soil; exch. K> 0.5 meq; Ca >15 meq; Mg>7 meq.; exch.Na> 0.2 meq/ 100 g soil; available P> 15 ppm; available S >20

	ppm; soluble Cl > 20 ppm; available micronutrients: B>2 ppm; Zn > 4 ppm; Cu > 4 ppm; Fe > 50 ppm; Mn > 100 ppm
12. Topography	Flat to slightly sloping, rolling to moderately sloping (below 20%).
13. Wind Speed	Strong typhoon-free. Minimal frequency of typhoon for stable nut yields.

Various sources: Magat (2001)

e). Varieties of Coconut

The main concern in the use of improved coconut varieties is their apparent need of high agricultural inputs. Coconut, like any other crop, requires proper cultural management and upkeep throughout its lifetime to sustain high levels of production. The use of genetically improved materials in combination with modest fertilizer application assures stable and high yields for many years.

Worldwide, there are two distinct types of coconut: the tall and dwarf.

e.1. Tall Varieties

The salient features of the more common tall varieties in the Philippines are the following:

e.1.1. Bago-Oshiro Tall (BAOT) - has an average variability of 32%. Copra per nut is about 210 gms and its fruit composition is fairly good. If properly maintained, it produces about 100 nuts/palm per year.

e.1.2. Baybay Tall (BAYT) - has high copra per nut weight of about 288 gms. relatively thin husk, generally good uniform stand, fast germinating, early flowering, and robust stand. At an average yield of about 88 nuts/palm year, it is capable of producing nearly 3.5 tons of copra per hectare under average growing conditions of rainfall and soil fertility.

e.1.3. Laguna Tall (LAGT) - has fairly high number of medium-sized nuts averaging 70 nuts/palm per year. Copra weight per nut is 195 gms on the average and fruit quality is good. This population is highly variable in terms of fruit components and pigmentation.

e.1.4. Makapuno (MAKT) - if not for its nuts filled with soft endosperm and very viscous liquid for which it is locally noted for, Macapuno is no different from other varieties. Owing to the lethal effect of the abnormal development of its endosperm, it is impossible to propagate without the aid of embryo culture. Prior to the development of the latter, Macapuno was propagated by planting seedlings grown from normal nuts obtained from Macapuno bearing palms.

e.1.5. San Ramon Tall (SNRT) - variability in this variety is high, with average copra weight per nut of about 220gms.

e.1.6. Tagnanan Tall (TAGT) - has excellent nut composition and although not really large in appearance, produces a mean copra per nut of over 300 gms Like Baybay, this population is highly uniform in stand. Although late maturing, an advanced generation of this variety produces an average annual yield of 3 tons copra per ha under average cultural management at the age of . 10 years fromplanting.

e.1.7. Hijo Tall (HJT) - like the Tagnanan tall, this variety which is found in Davao del Norte is a highly advanced generation of the local tall variety of Mindanao. It could easily give annual yields of 3 tons or more of copra per ha at maturity. It has a good combining ability with a local red dwarf which is currently a leading entry in a regional trial of promising hybrids.

e.2 Dwarf Varieties

The salient characteristics of the common dwarf varieties found in Philippines are the following:

e.2.1. Catigan Green Dwarf (CATD) - this dwarf variety (a.k.a. Rabara dwarf) produces round, medium-sized nuts with 210 g of copra per nut. Because of its inherent prolificacy and precocity (e.g. flowering could start as 20 months from planting), its cultural and climatic requirements are also more exacting than ordinary talls. A yield of cover 3 t copra/ha year can be easily achieved but this may be followed by a slump in the production in the following year. This material and other dwarfs are recommended only in areas which are highly suitable to coconut growing and for selective planting around houses, gardens, parks, and seed farms for mass production of F hybrid seednuts.

e.2.2. Tacunan Green Dwarf (TACD) - also know as Rabanuel dwarf or bilaka dwarf. Like the Catigan green dwarf, Kapatagan green dwarf, and various other green dwarf varieties, TACD is invariably early bearing. This dwarf type is easily recognized through its short spikelets, shrunken spathe, medium-sized nuts with long stigmatic and bulbous base. Copra per nut is about 230 g. In the Bicol region, this variety was observed to withstand strong

winds etter than other varieties.

e.2.3. Kinabalan Green Dwarf (KNDB) - discovered in Malita, Davao del Sur, probably the highest yielding dwarf type with an average copra per nut of over 270 g. It grows slowly in height and often displays a robust trunk.

e.2.4. Aromatic Green Dwarf (AROD) - early bearing and prolific. Its nuts are small, with thin meat, embryo covered by a clump of meat not commonly observed in a normal nut. Its unique sweetness and certain taste (aromatic as pandan) make it an excellent planting material for tender young nuts or "buko" production (7-8 month old nuts).

e.3. PCA Recommended Hybrids

The basic features of the nine local hybrids that are recommended by the PCA for general use. This recommended was based on the initial outcome of 15 years of continuous research in coconut breeding at the PCA research center in zamboanga where growing conditions are far from being perfect, i.e. 4 to 5 dry months per year. The nut size of these hybrids is medium, requiring 3 to 4 nuts to have a kilo (kg) of copra. Average yields range from 3to 3.4 t copra/ha at the age of 10 years. During very good years, copra yield can reach more than 5 t. After 15 years of study, nine (9) locally developed coconut hybrids and one (1) local tall were selected from the pool of 67 hybrids and cultivars established in 11 genetic trials at the PCA-ZRC genebank. The coconut hybrids usually flower earlier (3-4 years from field planting) and produce nuts 1-2 years earlier than most the local cultivars. Under intermediate growing zones, that is with 4to 5 dry months per year, these hybrids have a potential yield of 5 t copra/ha.

e.3.1. PCA 15-1 (CATD x LAGT) - a cross between the Catigan green dwarf and laguna tall. Although less precocious than the MAWA hybrid, it has bigger nuts and higher tolerance to bud rot disease to which the MAWA hybrid is found to be very susceptible. Seedlings of this type are brown or green.

e.3.2. PCA 15-2 (MRD x TAGT) - a cross between the Malayan Red Dwarf and the Tagnanan tall variety. It bears nuts which resemble the Tagnanan tall in shape and percentage composition. Pure hybrid seedlings are brown or green.

e.3.3. PCA 15-3 (MRD x BAYT) - a cross between the Malayan Red Dwarf and the Baybay tall. Like its male parent, it seedlings are recognizable by their brown petioles.

e.3.4 PCA 15-4 (CATD x TAGT) - a cross between Catigan Green Dwarf and tagnanan tall. It possesses high and stable yield and is moderately resistant to environmental stresses. It has a higher tolerance to bud rot and leaf spot diseases than the hybrid Malayan yellow dwarf x West African tall MAWA.

e.3.5. PCA 15-5 (CATD x BAOT) - a cross between Catigan Green Dwarf and bago-oshiro tall. It has high and stable yield with a potential yield of about 5 t copra/ha. It has high tolerance to bud rot disease than MAWA.

e.3.6. PCA 15-6 (CATD x PYT) - a cross between Catigan Green Dwarf and polynesian tall. It has high and stable yield with good fruit quality value (50%). It has higher tolerance to bud rot disease than MAWA.

e.3.7. PCA 15-7 (MRD x PYT) - a cross between Malayan Red Dwarf and tahiti tall. It has high and stable yields and moderately resistant to environment stresses. It has higher tolerance to bud rot disease than MAWA.

e.3.8. PCA 15-8 (TACD x BAOT) - a cross between Tacunan Green Dwarf and bago-oshiro tall. It produces medium to large nuts. It has a potential yield of 5 t copra/ha. It is resistant to bud rot and is relatively tolerant to adverse environment.

e.3.9. PCA 15-9 (TACD x TAGT) - a cross between Tacunan Green Dwarf and tagnanan tall. Nut size is medium to large. Copra per nut is about 286 - 303 g. it is highly resistant to bud and fruit rots (mainly caused by fungus Phytopthora palmivora Butl.) and is relatively tolerant to adverse environment.

Reciprocal hybrid crosses like TAGT x MRD (PCA 15-2R)
and TAGT x CATD (PCA 15-4R) had been produced in the country and planted in many wet and intermediate growing zones in the country in recent years. Just like the conventional hybrids, their performance are highly influenced by the environmental factors, crop nutrition, and fertilization management applied from nursery, field-planting year and onwards. In the field, soil nutrient deficiencies in N, K, Cl, S, P and micronutrient B are widely common, thus the need to correct these through the proper application of combined organic and inorganic/mineral fertilizers.