

THE EFFECT OF COCONUT DEVELOPMENT PROGRAMMES ON PRODUCTION

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Development programmes have been implemented by the Government since 1949 to improve and productivity from coconut lands. They include subsidised inputs and outright grants for a part of the expenditure incurred on field work. This paper attempts to evaluate their effect on coconut production.

Coconut production depends on a number of factors: environment, management, inputs and biology of fruit formation. The last factor is particularly important as palms bear fruits at monthly intervals and their development extends over a long period, exposed to varying environmental factors. The initial formation of spikelets from the flower bud takes place about 16 months before the opening of the inflorescence and fruits are harvested 12 to 13 months later. Thus, fruit development takes place over a period of 29 months. In the current analysis, this period is taken as 3 years for practical reasons.

Consequently, three year moving-averages are presented. The moving-average say for 1980 is the average of data for 1978, 1979 and 1980. This average when used is indicated in the text. Further, the average for coconut production is based on the area under cultivation with bearing palms and not on the total area. The Agriculture Census Reports indicated that 88% of the palms are bearing.

Coconut Development Programmes

The coconut development programs include rehabilitation, under-planting, replanting, new planting and planting

coconuts in citronella lands in the Southern Province. Reference is not made to the programmes to increase productivity-- growing pasture, cocoa, coffee and pepper under coconuts -- as the small holder and estate sectors have not supported them due to various constraints.

The first programme: According to the Census of Agriculture Report for 1946, about 40,000 ha of coconut palms were over 60 years age out of the 434 000 ha under coconut cultivation. These findings lead to the appointment of the Ceylon Coconut Commission to suggest measures to rehabilitate the coconut industry. They recommended re-planting of holdings with senile palms and promoting the use of fertiliser. Issues of selected coconut seedlings commenced in 1949 and subsidised fertiliser in 1956. Estates received a subsidy of one-third the cost of fertiliser and the small-holders half the cost. The

Table A

Under-planting	Rs 12,000 per ha in three instalments
Re-planting	Rs 12,000 per ha in three instalments
New planting	Rs 11,500 per ha in three instalments

Table B

Item	Area Developed (ha)	Cash Payments (Rs)
Rehabilitation	91,200	99,400,000
Under-planting and replanting	31,200	127,200,000
New planting	26,400	125,900,000

fertiliser subsidy scheme terminated in 1973.

The second programme: Subsidised coconut seedlings and cash subsidies for filling vacancies, removal of excess

palms, cutting contour drains were introduced in 1974; under-planting, replanting and new planting from 1977 and cutting husk pits later on.

Subsidy rates effective from 1 April, 1988 were: Table A

The performance of the subsidy schemes up to the end of 1988 was as follows: Table B

Planting coconuts in citronella lands: Undertaken to assist farmers who found that growing citronella was uneconomic. Nearly 9,000 ha were developed in the Hambantota and Matara districts. Coconut seedlings and fertiliser were supplied free and Rs 0.50 was paid for each seedlings for 8 years, provided maintenance was satisfactory. The expenditure incurred was Rs 6.4 million. The general observations are that most of the seedlings planted are dead due to drought and neglect.

East Coast Rehabilitation Project: Rehabilitated 12,000 ha in the Batticaloa, Polonnaruwa and Ampara districts devastated by a cyclone in 1978. It was a composite project designed to provide all the inputs required to develop the coconut industry. An evaluation of the project has not been carried out recently.

The under-planting programme: It has run into difficulties as 87% of the farmers were not eligible to receive the second and third instalments as they have not completed the necessary field work, largely removal of old palms.

Indications are that the programme would be successfully completed by an insignificant number of persons (1)*. A basic defect of this programme was the selection of blocks for under-planting with palms relatively young. Naturally, the farmers would be reluctant to uproot those bearing palms.

The re-planting programme: The key problem appears to be the lack of importance given by the implementing agency. Only 17% of the farmers qualified to receive the last two instalments of subsidy (1). On the other hand, replanting in a small pilot project carried out in Rambukana area has been more successful. About 66 ha in 166 allotments were replanted with an improved variety of coconut seedlings — CRIC 65. Intercrops, largely bananas, were planted along with coconuts. They provided a satisfactory income to the farmers until the palms reached bearing stage, except during first year (2). Although, the project is small, it is based on sound principles: selection of holdings with senile palms, promotion of inter-crops and development on a project area basis.

The new planting programme: It has been carried out in environments not quite suitable for coconut cultivation. The mortality rate of the seedlings planted has been reported to be high: in the Puttalam district it was 47%, attributed to drought (3).

In a survey of 12 000 ha of re-planting and under-planting carried out, 1750 ha were expected to be in bearing in 1986, but, only 25 ha were in bearing — 1.4%. The delayed bearing offsets the benefits in that investment both to the grower and the government (4).

The number of coconut seedlings issued for the programmes outlined was:

1950 to 1960	:	8,600,000
1961 to 1970	:	15,200,000
1971 to 1980	:	13,400,000
1981 to 1988	:	13,900,000
Total		51,100,000

The expenditure on the implementation of the programmes from 1974 to 1988 was Rs 374,300,000.

Coconut Production Trends

The area under coconut cultivation has decreased from 466 000 ha in 1962 to 419 000 ha in 1981, the existing area is likely to be about 400 000 ha. Domestic consumption of coconuts has increased from 1237 million in 1960 to 1701 million in 1988. The climatic conditions have deteriorated with a higher frequency of drought months each year. Fertiliser has been used only in about 25% of the area under coconut cultivation. These are problems that the industry is facing.

The objective of the development programmes initiated by the Government, except for the citronella scheme, was to increase production and productivity from coconut lands. How far has that been achieved in the light of the distressing factors outlined in the previous paragraph?

The first programme was based on the recommendations of the Coconut Commission and the subsequent one appears to be on an *ad hoc* basis, adding various items over the years, without a reasonable assessment of the problems faced by the coconut industry.

The coconut production trends are indicated in Table 1. The period from 1950 to 1955 is considered as the pre-programme period.

the period (c) dropped almost to that of period (a) as a result of unfavourable weather conditions and the dislocation of management practices in the estate sector arising from land reforms and period (d) showed the highest production with 6700 nuts ha/yr.

The surge in production in 1985 and 1986 giving 8300 and 8600 nuts ha/yr is remarkable. Presumably, it was due to favourable climate, planting material and development activities like promotion of soil moisture conservation methods and fertiliser usage. For a continuous period of five years from 1981 to 1985, drought months were less than 2.1 each year. When there was a similar period from 1961 to 1964, production reached 7300 nuts per ha in 1964, the highest figure recorded between 1950 and 1984. About 16 million coconut seedlings have been issued to the growers between 1950 and 1965. Assuming a survival rate of 65%, 10 million young palms in the prime of their life are in full bearing in 1985. They could make a substantial contribution to production. This factor may account for the increase of 1300 nuts per ha in 1986 compared to the production in 1964.

Two significant factors have vitiated the potential for coconut production that would have been possible through the development programmes: extension and climate. Development of smallholdings scattered throughout the

Table 1
Crop yields in relation to the pre-programme period

Period	Nuts ha/yr	Drought period per year		Fertiliser used p/year	
	Average	%	Months	%	(MT)
(a) 1950 to 1955	5 800	100	2.33	100	14 000*
(b) 1961 to 1970	6 400	110	1.95	84	54 000
(c) 1971 to 1980	5 900	102	2.89	124	41 000
(d) 1981 to 1988	6 700	116	1.91	82	39 000

* Annual average fertiliser used as reported in (5).

Table 1 indicate that there has been an upward trend in coconut production from 1960 onwards. Period (b) showed an increase of 10% nuts per ha/yr over the period (a); production in

country was undertaken. The number of trained extension workers was limited. Hence, they could not cover such a large area, resulting in an inadequate service to those participating in the

development programme. In a situation like this, remedial measures to give a satisfactory service to the growers with a restricted staff were known — development on a basis of project areas and nucleus estates — but they have not been considered by the implementing agency. It is known that drought periods reduce coconut production, yet no effort has been made between 1956 and 1973 to promote soil moisture conservation methods. Although contour drains and husk pits were introduced later, an overall plan to conserve soil moisture on coconut lands has not been considered yet.

There is one asset to the country resulting from the coconut development programmes implemented. From 1950 to 1988, 51 million coconut seedlings have been issued to the growers. Assuming that 65% of them have survived, 33 million young palms are growing now, some of them in full bearing status. Their contribution to national production, if maintained in a satisfactory condition, would be at least 2000 million nuts per year.

Production in relation to drought:

The coconut palm has no storage water on which it can draw during periods of moisture stress. It depends entirely on the root system to absorb water from the surrounding soil. Therefore soil moisture is of vital importance for its growth and reproduction. Any prolonged moisture stress during the long period of fruit formation will reduce the quality and the quantity of fruits harvested. The adverse effects of drought are illustrated in Table 2.

Drought period per year (moving average)	Nuts per ha/yr
2.0 months or less	6600
2.1 to 2.5 months	6400
2.6 to 3.0 months	5800
3.1 months or more	5450

The progressive decline in production as the number of drought months per year increases is clear. The drought months indicated in Table 2 are scat-

tered over the years. If they are for consecutive years (Table 3), a different production pattern emerges.

Period	Nuts ha/yr in the last year	Fertiliser used p/yr (MT)
Less than or equal to two months per year		
1961 to 1964	7300	46 000
1973 to 1975	6800	31 000
1981 to 1985	8300	39 000
More than or equal to 3.3 months per year		
1956 to 1958	5200	33 000
1976 to 1978	58 00	34 000

With longer drought periods per year, crop production has been reduced to less than 6000 nuts ha/yr. These figures illustrate adequately the importance of moisture in the soil throughout the year for satisfactory coconut production.

Future Coconut Development Programmes

It is stated that, "The fundamental malaise of the coconut industry, apart from the price problem commented upon earlier, has been the unpredictability of weather. Frequent drought have not only lowered incomes, but have denied the producer of a return for investments in fertiliser, new planting and cultural practices. The element of uncertainty thus introduced by the vagaries of weather also prevents the producer from taking a long term point of view which is essential in a perennial crop industry" (5).

Future planning for the development of coconut holdings should be considered with these inescapable facts as a base. If a small-holder gets a satisfactory farm-gate price for the produce and is insulated from the vicissitudes of weather, he will provide the necessary inputs and management practices to increase production, probably without subsidy payments.

Countering the adverse effects of drought on coconut production is con-

sidered in terms of irrigation only. No doubt, that is a good practice, but due to the high costs involved little progress

has been made so far. Cheaper physical and biological methods could be adopted to minimise drought damage in production as reported in (6).

Thus, the priorities for a coconut development programme should be: (a) assuring a fair farm-gate price for coconuts, (b) minimising drought damage, (c) promoting biological methods of farm management to reduce the dependence on inorganic fertiliser, (d) continued distribution of good quality seedlings, (e) replanting coconut holdings with senile palms and (f) provision of an extension service that understands the farmer.

If a comprehensive plan to develop the coconut industry incorporating all the above suggestions cannot be carried out due to shortage of funds, it is advisable to suspend temporarily the development activities in progress and utilise all the available resources to promote only soil moisture conservation on coconut holdings for the next four years. That alone could guarantee a production over 3000 million coconuts per year.

Summary

Coconut development programmes have been implemented from 1949 to increase production from coconut holdings. There has been an upward trend in production since 1960, fluctuating considerably with the vagaries of weather and the application of man-

agement practices. Coconut production for the period 1981 to 1983 averaged 6700 nuts ha/yr compared to 5800 nuts ha/yr for the pre-programme period 1950 to 1955. The increase could be attributed to five years of favourable weather conditions and palms planted prior to 1965 reaching full bearing status during that period.

About 33 million young palms are growing now, some of them in their prime of life, as a result of the continuous supply of coconut seedlings to the growers. Their contribution to national production, if maintained in a satisfactory condition, would be at least 2000 million nuts per year.

The application of inorganic fertiliser has not increased production to the expected level, because of soil moisture stress caused by prolonged drought periods. The key factor to increase coconut production is soil moisture conservation. That has not been considered adequately in the past, and hence, vitiated the potential for coconut production possible through the development programmes implemented.

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