

Are coconut home gardens playing significant role in national coconut production?

An analysis of the coconut sector in Sri Lanka

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The contribution of coconuts to livelihoods and the economy of Sri Lanka is quite significant. Coconuts have contributed Rs. 108.9 Bn (US\$ 609.77 Mn) in foreign exchange in 2019, which accounted for 1% of the GDP. This sector employs approximately 135,000 people in the production and industry sectors and provides livelihood for over 700,000 people.

The coconut palm was once a major plantation crop in the humid tropics, including Sri Lanka, but is now mainly and widely cultivated by the smallholders. At least 96% of the total world coconut production comes from smallholdings. The total extent of coconut in Sri Lanka at present is 443,538 ha. According to census and statistics published by the Central Bank

(2014), the smallholding sector in Sri Lanka occupies 83.7% of coconut cultivating lands signifying the important role played by the smallholder sector in national coconut production. The smallholding sector is defined as coconut holdings of size below 20 acres (8.1 hectares). This includes home gardens where coconut palms are scattered.

Of the total districts cultivating coconuts, three districts namely Kurunagala, Puttalam and Gampaha lead in coconut cultivation, accounting for more than 70% of coconut lands in the country (Figure 1). These are the districts that contribute most to the national coconut production (Figure 2).

The Table 1 shows the extent (ac) under coconut, by district and sectors in 2014 and the Table 2 shows



Table 1. Extent (ac) under Coconut by Districts and Sectors- 2014 (source: Central Bank Report 2014)

District	2014			
	Total extent (Ac)	Small Holding Sector (Ac)	% Small Holding Sector	Estate Sector (Ac)
Puttalam	186,053	141,062	75.8	44,991
Kurunegala	419,312	329,556	78.6	89,756
Gampaha	133,551	115,957	86.8	17,595
Sri Lanka	1,095,983	917,345	83.7	178,638

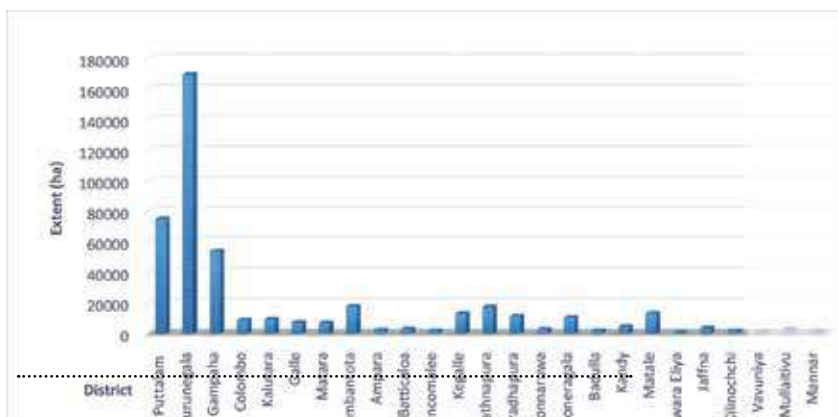


Figure 1. Coconut extent in ha in district wise (Source: Census & Statistics, 2014)

the number of scattered coconut trees and their estimated extent in acres in smallholding sector by district and sector wise. For the estimation of extents under scattered trees, the number of trees per acre was taken as 64. The scattered trees in the smallholding sector are mostly confined to home gardens and accounts for 64.6% out of total of 83.7% smallholding sector in extent. Of this 64.6% of home gardens, 41.13% is in three major coconut growing districts; Puttalam, Kurunagala and Gampaha, majority being in the Kurunagala district. The rest 23.47% home gardens are in all the other coconut growing districts.

The balance 19.1% (83.7%-64.6% = 19.1%) smallholding sector seemed to be the organized smallholders with systematically planted coconut. The increase in home gardens in Sri Lanka is noticeable during past many years, undoubtedly as a result of the high rate of coconut land fragmentation for land sales as well as for property sharing among children. From this data analysis, it is evident that in coconut home gardens, in other words the scattered trees, play a significant role in the coconut production in Sri Lanka.

It appears that much attention and extension

work has not been concentrated on to this category may be due to the prioritization of the other categories such as the estate sector and the organized smallholding sector. In this home garden category, by experience, the writer is certain of that coconut is grown as part of the home gardens primarily for consumption and not with a major income generating intension as in the case of tea small home gardens. If there is surplus coconut, they are sold to the village coconut buyer finally ending up in

the coconut industries. Therefore, management of those scattered coconut trees in home gardens is minimal. Coconut extension service does not seem to reach much of this category and thus coconut is surviving in many home gardens without the application of fertilizer and conservation of soil moisture.

The coconut industry in Sri Lanka has, at present, reached a transitional stage, since an increasing demand for both processed coconut products and fresh nuts has generated in the international market. The world demand for high-priced coconut high-value products is increasing at an exponential rate (Figure 3). This shows that the market for coconut high-value products is huge and growers and manufacturers have the opportunity to increase their incomes and bring higher foreign exchange from coconut to the country. However, the current annual national production of coconuts in Sri Lanka varies at a low level between 2,450 and 3,000 million nuts. For example, during the period 2015 to 2019, coconut yields depended heavily on climatic factors, particularly on the amount and distribution of rainfall as coconut is a rain-fed crop.

A deficit in soil moisture adversely affects the growth of different parts of the coconut tree in

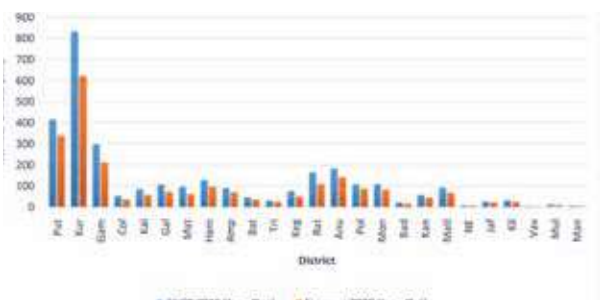


Figure 2. National coconut production district-wise (Mn nuts) (Source: CRI)

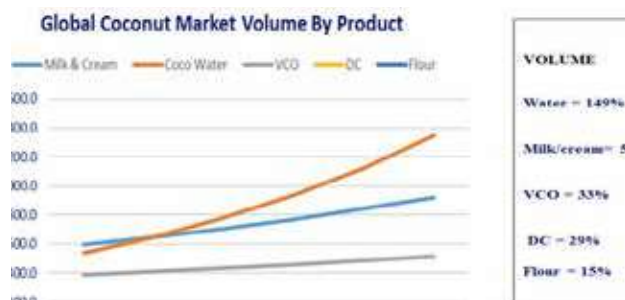


Figure 3. Demand for coconut high-value products (Source: International Coconut Community)

Table 2. Number of scattered coconut trees and estimated extent in acres (ac) in smallholding sector under coconut by district wise- 2014 (Transformed data from Central Bank Report 2014)

District	Number of scattered trees		Total No. of scattered trees % Small Holding Sector	Estimated Extent in scattered trees Estate Sector (Ac)	Estimated extent as % (district wise and national wise)	% against total extent of coconut land (Cumulative)
	Holdings ¼ Acre and below	Holdings above ¼ Acre				
Puttalam	323,133	6,606,858	6,929,991	108,281	9.87	
Kurunegala	470,471	15,666,011	16,136,482	252,132	23	32.87
Gampaha	793,374	5,002,692	5,796,066	90,563	8.26	41.13
Sri Lanka	5,377,927	39,938,192	45,316,119	708,064	64.6	64.6

(Country total coconut extent- 1,095,993ac)

varying degrees, also adversely affecting productivity to a considerable extent. Soil moisture availability influences inflorescence initiation, female flower development, abortion of spadices, delay in opening of spathes, shedding of button nuts and immature nut fall and furthermore reduction in size of developing nuts and cracking of coconut shells resulting in undeveloped kernel. For example, due to the severe drought in the year 2016, the coconut production was declined by 396 Mn nuts in 2017 when comparing with the previous year 2016 (Table 3).

During the lean production years, mainly attributed to droughts, the coconut industry suffers heavily because of a shortage of nuts and as a result, high farmgate nut prices, making their processed products less competitive in the international market. During the same time, the consumers also suffer from high price of nuts in the open local market. Since about 70% of the total coconut production in Sri Lanka is locally consumed, unlike in Indonesia and the Philippines, the price of coconut is positively associated with national coconut production in Sri Lanka (Figure 4).

The actual industry and local consumption need



of coconut as fresh nuts and oil, has been estimated to be about 3,795 million (Figure 5) to cater to the ever-increasing demand for coconut in the local and international markets. According to statistics, the local coconut oil industry has the capacity to produce about 80,000 Mt of coconut oil per year, but due to a shortage of nuts, the result of low national coconut production, average coconut oil production has been limited to about 40,000-45,000 Mt per year.

These are shortage of about 35,000 to 40,000 Mt of coconut oil within the country. Imported Palm

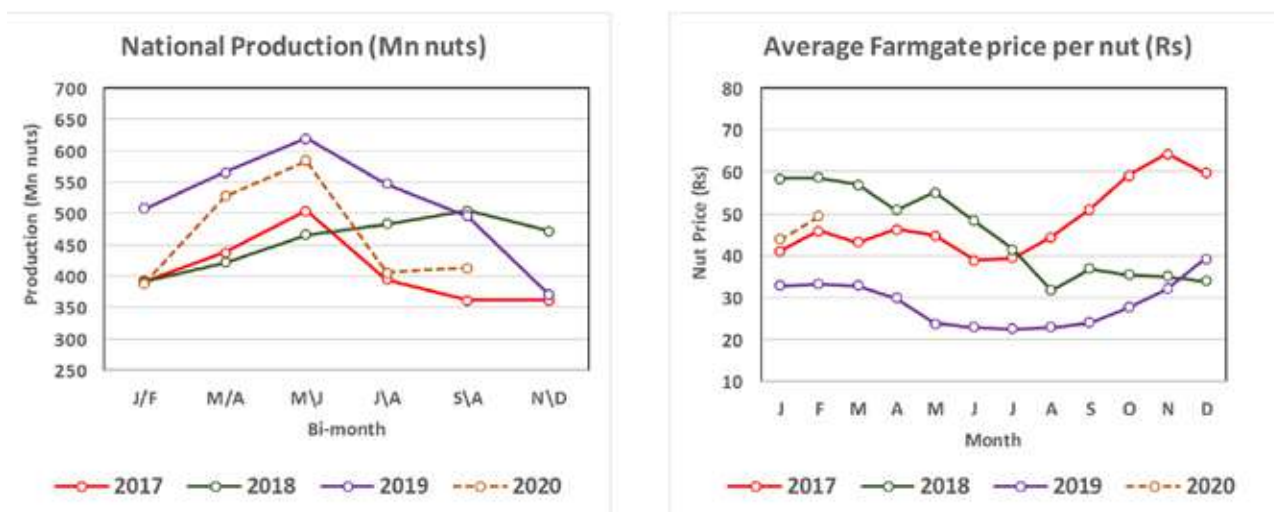


Figure 4. Fluctuations in national coconut production and farm-gate coconut price (Source: CRI)



Table 3. Bimonthly and annual national coconut production in Mn nuts from 2015 to 2019 (Source: CRI)

	2015	2016	2017	2018	2019
January/ February	414.2	439.1	391.5	390.9	508.0
March/April	394.0	513.2	438.1	421.4	565.8
May/June	613.4	586.8	503.4	465.6	619.1
July/August	609.8	539.2	394.7	482.8	547.6
September/ Oc- tober	536.8	436.9	361.7	504.4	495.2
November/ December	458.7	330.1	360.7	471.7	370.8
Total	3027	2846	2450	2737	3107

Oil and other edible oils are used as substitutes for coconut oil for direct consumption and for other industries such as soap, margarine and confectionary industries.

According to statistics, around 180,000 to 250,000 Mt of edible oils have been imported to the country annually over the past three years (Table 4) both for consumption as well as for industrial usage.

Hence there is a need to increase coconut production and more essentially, lessen the year to year yield variation in the country by increasing the production from the existing coconut cultivations as a short/medium term measure as well as by new planting as a long-term strategy.

To sustain the yield of an existing bearing coconut tree, it is necessary to have a campaign to promote recommended agricultural practices such as

nutrient management in the form of either use of organic or inorganic fertilizer in correct quantities, the correct method of application at the correct time as well as by providing or conserving required moisture during rain free periods. In that respect, home gardens can play a dynamic role, as at present the estate sector and medium scale planting sector are already, to a certain extent, apply the necessary management practices since their lands are run as income generating units. Two diagnostic surveys carried out by CRI have also identified that even during the period of operation of the government fertilizer subsidy scheme, only less than 30% of the coconut lands have been fertilized.

It is the home gardens that were not applying fertilizer due to various reasons, most probably due to not being aware of the need of fertilizer to sustain coconut yields from the coconut tree.

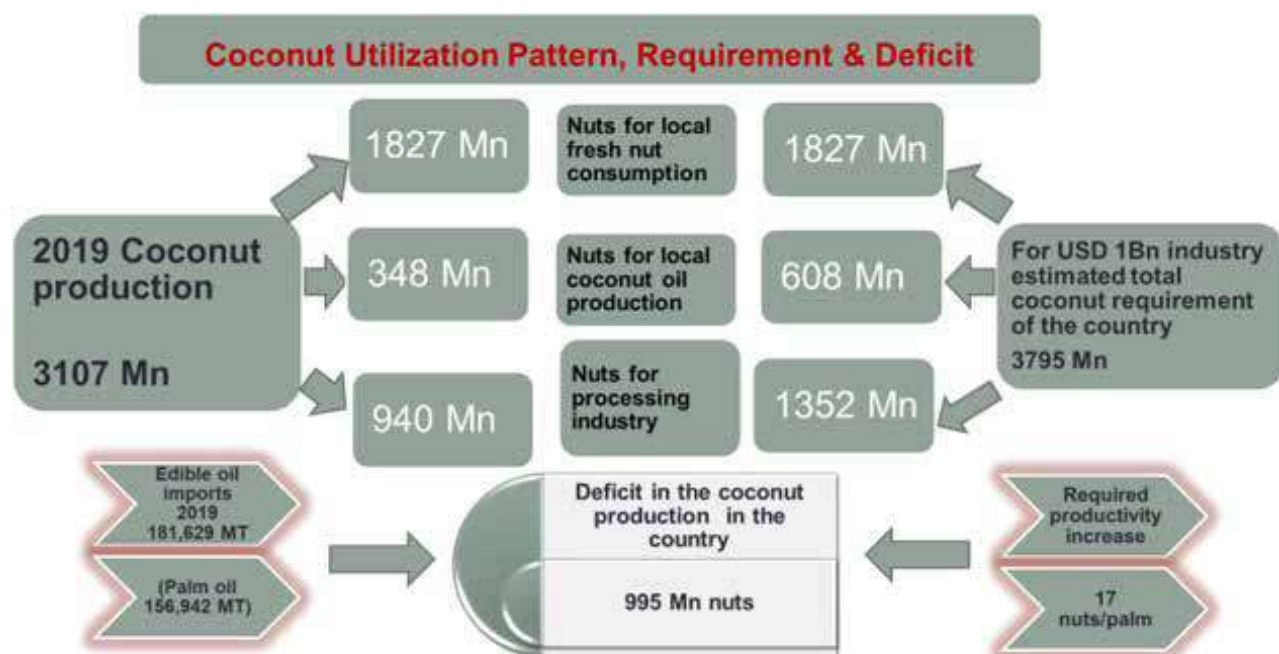


Table 4. Coconut oil production and other edible oil imports (MT) (Source: CDA)

	2013	2014	2015	2016	2017	2018	2019
Coconut oil	45,208	45,268	52,790	49,567	12,784	10,913	44,648
Other edible oil	156,657	162,766	164,102	108,192	229,632	232,802	181,629

Table 5. Nutrient removed (loss) from the soil (Kg/ha/year) by harvesting coconuts (Source: CRI)

Component of the nuts	N	P	K	Mg
Kernel	46.07	6.38	24.25	3.67
Husk	24.52	2.67	146.56	5.72
Nut water	0.73	0.3	7.59	0.28
Shell	4.21	0.28	7.16	0.46
Total	75.53	9.63	185.56	10.13

N: Nitrogen, P: Phosphorus, K: Potassium, Mg: Magnesium



As the income gained by selling spare nuts from the home gardens are not considered as very important income for the family by the home garden owners, a different and effective extension approach needs to be introduced to them to motivate them to manage coconut in their home gardens. Thus, it is proposed that coconut extension programs should be more expanded towards the home gardens which are not managed well with regular application of fertilizer and soil moisture conservation methods, although those units appear to represent one of the

major fractions of coconut cultivation.

Fertilizer may not be easily accessible to home gardens and not being available in small packaging, may also be some of the reasons for not applying fertilizer in home gardens. Currently fertilizer is only available as a minimum of 50 kg size bag. This is where the intervention of the coconut extension services should come in and play a big role by educating the owners of home gardens and making necessary agriculture services easily accessible to them.



The basic approach of the management of coconut is the effective management of water and nutrient. Mulching the manure circle (2m around the palm) of the coconut palm is a simple, low cost but effective recommended soil moisture conservation practice in many coconut growing countries for stable coconut yield during rain free period by mainly preventing loss of soil moisture by evaporation. In Sri Lanka during a prolong drought in 2016, it was very clearly observed that the coconut farms with coconut trees properly mulched and added with husk pits were the least affected by the drought. In order to conserve soil moisture around coconut trees in home gardens without any additional cost, mulching the trees with various types of organic materials freely available in-home gardens can be effectively used. Materials such as coconut fronds, coconut spathes, coconut bunch stalks, coconut husks, tree lopping, banana chunks, home garden sweepings (dried fallen leaves), organic household waste and weed trash can be used for mulching in home gardens. These are usually collected and burnt in many home gardens to keep the home garden landscape clean



and nice looking. Fallen coconut fronds should be cut into a few pieces and placed loosely in layers around two-meter circle from the coconut tree base, leaving one foot from the base. Similarly, coconut husk can be arranged around the tree. Coconut husk is rich in K nutrient, so they provide K nutrient to the soil as an additional service. In home gardens, a combination of those materials can be used for this purpose.

Mulching with organic materials not only prevents loss of moisture from the soil, but also reduces soil temperature, incorporate organic matter to improve the soil physical characters after decomposition which again helps to improve soil moisture retention and nutrient holding capacity, add nutrients by decomposing the organic materials, improve activities of earthworms and favorable soil microorganisms creating a better environment around the tree to facilitate proper root growth and avoid weed growth. The first mulch and upgrading the mulch should be done when the soil is wet preferably before the end of rainy season for effective conservation of soil moisture, but progression of the mulch can be done at any time.

Mulching is basically a practice to conserve soil moisture although it has lots of other benefits as described above. However, mulching alone cannot improve entirely the productivity of a coconut tree to its potential yield. It requires balance N, P, K nutrients mainly and Mg in addition in Sri Lankan condition. Hence recommended coconut fertilizer mixtures either in the form of organic or inorganic at their right dose at right time needs to be added to a coconut tree annually to supplement the nutrient loss from coconut palm (Table 5). In addition, 1 Kg of Dolomite is recommended to be applied along with fertilizer to supply Mg in Sri Lanka. Application of fertilizer needs to be done when the soil is moist preferably immediately after the intense rains in the rainy season.

Extension workers need to take this message; the need and importance of adding fertilizer and mulch to each coconut palm as per the recommendation in the home gardens and elsewhere to achieve higher and stable nut yield. Increased coconut yield will help the coconut industrialists to achieve higher foreign exchange income from the coconut sector. An increase in the productivity of coconuts in the home gardens, which appears as one of the major fractions of coconut cultivation, not only it will help narrow down the coconut shortage in the country, but also improve the income of households. *Reproduced from: Cocoinfo International Vol. No. 27, No.1 2020.* ■