

LAND SUITABILITY ASSESSMENT OF COCONUT GROWING LANDS IN THE COCONUT TRIANGLE

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1. Introduction

The total extent of pure coconut stand in the country is estimated at approximately 323,887 ha (Dimantha, 1984). The so - called coconut triangle 248,405 ha or around 75 per cent of the country's coconut growing land (excluding coconut in the mixed stands and home gardens). and is situated almost entirely within the Kurunegala, Puttalam and Gampaha districts. According to the **present land use** maps prepared by the Survey Department in 1984, the respective extents of pure coconut stand in these districts are as follows:

District	Extent (ha)	Percentage
Kurunegala	165,250	67
Puttalam	47,376	19
Gampaha	25,000	10
Kegalle	10,779	04
Total	<u>248,405</u>	<u>100</u>

It must, however, be recognized that there is a great diversity of environmental conditions across this triangle, which is far from homogeneous as commonly perceived. One could recognize at least **seven** broad kinds of coconut growing environments or **coconut eco-systems** within this triangle. Although coconut is presently grown across all these eco-systems, some of these environments are ideally suitable for coconut while others are less ideally suited. Furthermore, within an eco - system there could be different types of soils, some deep and coarse - textured, others shallow and gravelly, and some moderately deep and fine - textured. Obviously the productivity of the coconut palm will be different on these different types of soils even within each eco - system. Our main task, therefore is to identify, characterize and demarcate these different kinds of coconut growing soils according to their potential, or else their **suitability ranking**, for coconut.

The modern methods of **land suitability assessment** have evolved in a systematic and scientific manner over the last 100 years, and today constitute a powerful tool that could be used for several different purposes. **Firstly** it could be used to formulate appropriate strategies for both coconut research and development. **Secondly** it could be used to assess the suitability for the different kinds of coconut growing lands with a view to ranking them according to their yield potential. **Thirdly** it could be used as a very effective extension tool for making environment - specific and location - specific recommendations for coconut management and fertilizer usage. **Fourthly** it could be used to exploit the optimum potential yield from each suitability class by adopting a balanced package of management practices. Several other kinds of examples can be given. Among them one should emphasize the need for testing different cultivars in different environments and suitability classes that are properly characterized.

2. An Overview and General Description of the Area

The mean annual rainfall in the **Northern areas** (Dry Zone) of the triangle is between 1000 to 1250 mm, which can be regarded as the lower limit for coconut. But this is compensated for by the high solar radiation or number of sunshine hours per year which promotes high productivity when moisture is not limiting. In the **Southern areas** (Wet zone) of the triangle, the mean annual rainfall is between 2250 to 2500 mm which is quite adequate for coconut. But the solar radiation in these southern areas is lower than that in the northern areas. The middle or **central parts** (Intermediate zone) of the triangle has the best combination of both rainfall and solar radiation for coconut production.

According to the agro - ecological demarcation of the country, the coconut triangle falls within five **main agro - ecological regions (AERS)** and three sub AERS as shown in Table 1 (Also see Fig. 1).

AERs namely IL_3 , IM_3 and IL_1 . The rainfall distribution pattern for IL_3 is quite similar to that of IL_1 , except that the mean annual rainfall value in IL_3 is lower than in IL_1 . Within the AER of IL_3 , the most productive coconut lands are found on the deeper

Table 1 - Agro - ecological regions of the survey area

Zone	Region (AER)	Agro - ecological	Rainfall
DRY	DL_3	Regosol and Latosol (sub-area of the Dry Zone)	Low
	DL_1	Dry (REB sub-area)	
INTERMEDIATE	IL_3	Semi - dry	Moderately Low
	IL_1	Semi - wet	Adequate
	IM_3	Semi - wet (mid country)	, ,
WET	WL_3	Moderately - wet	Moderately high
	WL_2	Wet	High

In the **Dry zone**, coconut is restricted to the great soil groups of Regosols and Latosols for valid reasons. In the case of **Regosols** such as the **Weliketiya** and **Kalpitiya** soils series, the soils are deep and friable and there is an underlying lens of fresh water. Hence in this dry zone environment, coconut thrives because the roots have ready access to the underlying moisture. In the case of the **Latosols** such as the **Wilpattu** and **Gamburu** soil series, the soils are very deep (over 30 feet) and friable, and since there is no run - off of rain water on these soil, the moisture is stored in the whole depth of the soil. Because the soils is friable, the roots can penetrate and use the stored moisture during the dry season. In the case of the reddish brown earth, coconut cannot survive the dry season because of the shallow and non friable nature of the soil, and hence absence of coconut in the dry zone on these soils except where there is seepage moisture under village tanks or irrigation channels.

In the **Intermediate zone** there are three

soils around Battulu Oya, Rajakadaluwa and Ambekele. The productivity of coconut declines in the drier areas with shallower soils found north of Deduru Oya. The most productive coconut plantations of the coconut triangle are found within IL_1 and IM_3 which has the best combination of soil, rainfall and sunshine hours for high productivity of this crop. Coconut is also found as a mixed home garden crop with interplanting of banana, coffee and yams and tubeers according to the local soil pattern.

In the **Wet zone** of the coconut triangle, there are two major AERs namely WL_2 and WL_3 . Despite, the higher rainfall, the solar radiation or sunshine hours is lower, and therefore coconut yield tends to be lower. Despite the better soils in WL_2 , coconut yields are lower because of the lower sunshine hours. In WL_3 , the soils are mainly of the cabook type. In WL_3 coconut performs better on the mid slopes and the foot slope of landscape than on the upper slopes where the cabook is harder. Pineapple is the best adapted intercrop in WL_3 .

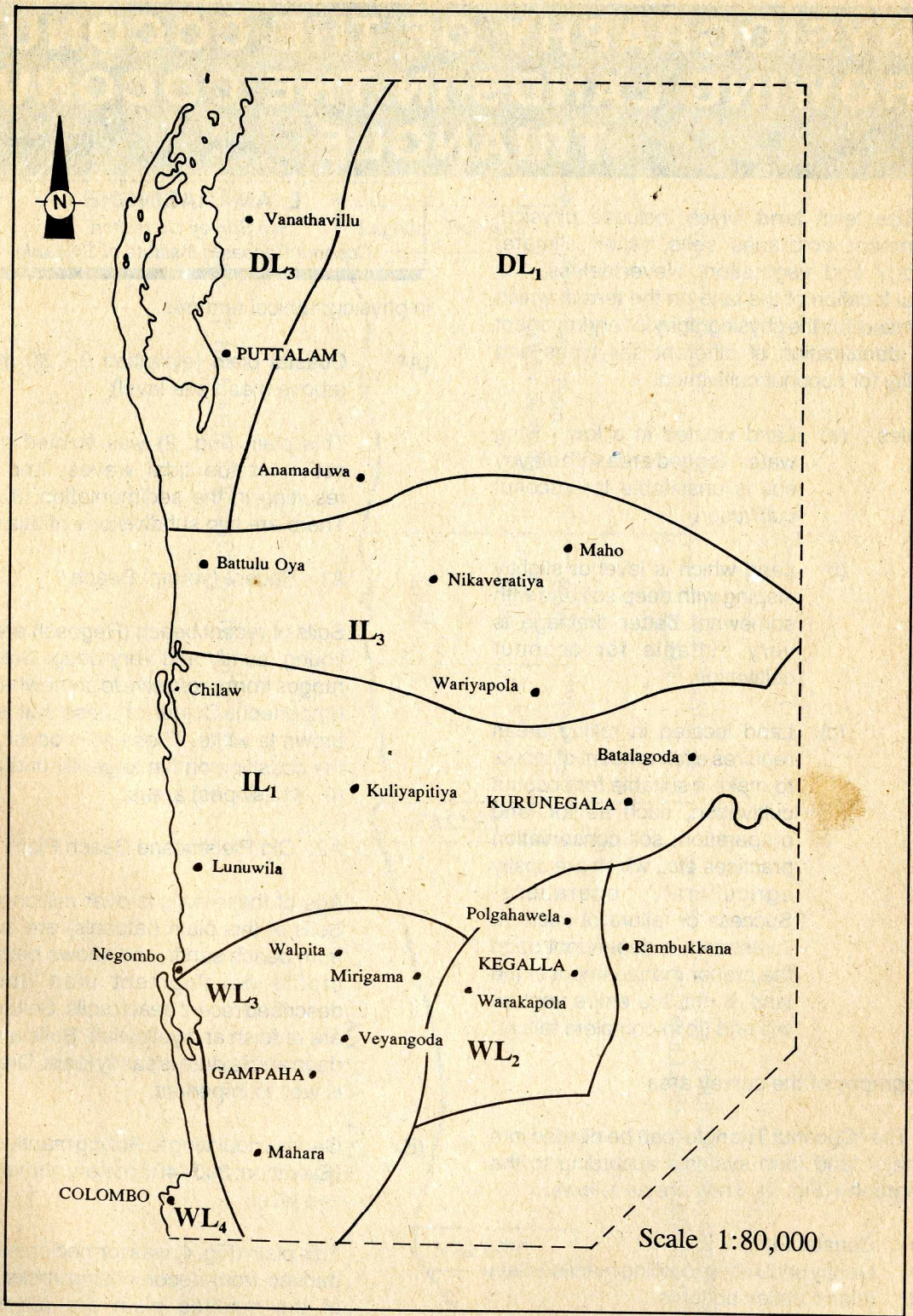


Figure 1. Agro ecological map of the survey area.