

Research Paper

Exploring and Mapping of Potential Areas for Fruit Crops in Sri Lanka



A.G. Chandrapala^{1*}, S.M.V. Pushpakumara¹, H.K. Kadupitiya¹, M.A.K. Munasinghe²

¹ Natural Resources management Centre, Peradeniya, Sri Lanka

² Food and Agriculture Organization of the United Nations

*Corresponding Author: ag.chandrapala@yahoo.com

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Abstract

Land suitability assessment is crucial for identifying potential fruit crop areas to enhance production and recommend strategies for effective crop management. The suitability analysis recognizes marginally suitable regions, assisting decision makers in identifying limiting factors and guiding decisions like new planting, replanting, diversification, and adoption of climate-friendly practices to boost land productivity. Moreover, it enables stakeholders to identify new areas suitable for different fruit varieties, emphasizing the land's unique qualities. Matching crop requirements with available resources through land suitability analysis has become an urgent necessity to sustain agricultural land productivity in Sri Lanka. In this context, assessment was conducted to identify potential fruit crop growing areas for Mango (*Mangifera indica*), Banana (*Musa spp*), Pomegranate (*Punica granatum*), Pineapple (*Ananas comosus*), Rambutan (*Nephelium lappaceum*) and Durian (*Durio zibethinus*), based on climatic and soil parameters, using Arc-GIS software. Climatic and soil requirements for each crop were determined based on recommendation from the Department of Agriculture. Parameters such as maximum and minimum air temperature, mean annual rainfall, relative humidity, and soil properties were employed to create crop suitability maps. The results of the crop suitability classification indicate a considerable extent of potential areas for fruit cultivation exist in unconventional locations. While some districts exhibited limited overall potential for fruit cultivation, specific divisional secretariat divisions in Sri Lanka were identified as highly suitable for fruit cultivation.

Keywords: Exploring and mapping, Fruit crops, Resource suitability

Introduction

Although relatively small, Sri Lanka is a country with significant agroecological diversity, reflecting the diverse landforms associated with Valleys that run the length of the country. The effects of those landforms on soil formation processes, local climates, the distribution of water resources, and vegetation patterns result in a variety of quite complex farming systems across Sri Lanka. One important implication of this variety of farming systems is that the comparative advantage of different areas of Sri Lanka for the production of different fruit crops, whether for commercial purposes or for household food security, differs significantly from place to place. In designing agricultural development policies for the country, the geographic diversity of Sri Lankan agriculture needs to be considered.

Ministry of Agriculture has taken steps to implement a new concept – the “One Village, One Fruit” program to enhance the availability of fruits even during off-season. Under this new project, the ministry plans to cover 15,000 villages as fruit-growing villages by introducing one fruit crop for each. Measures will be taken to provide 1,000 plants to each village and the fruit varieties are selected considering the soil of the area and the climate (News.lk, 2016). With the expansion of fruit crop cultivation in Sri Lanka, policy-level decisions need to be made to penetrate into European markets where unit prices will be higher and more foreign revenue will arrive in the country. Branding of products will give enormous capacity to become an elegant

contributor to the world fruit market (Gamage *et al.*, 2020).

About 3,537,646 ha of land has been used for agriculture and approximately 106,000 ha of land are utilized for fruit cultivation in Sri Lanka (DoA, 2018). There is a possibility of expanding it into non-conventionally fruit-growing areas to increase the national fruit production. Therefore, the demand for exploration of alternate lands which are suitable for fruit crop cultivation is increasing.

Agriculture in Sri Lanka is one of the sectors that has received prominent attention, particularly for paddy cultivation. However, over the years, the horticulture sector, encompassing fruits and vegetables, has been steadily gaining significance and has become a major contributor to the overall agriculture sector. Approximately eighty different varieties of fruits and vegetables are grown in various agro-climatic regions of the country with rich natural resources found in different climatic zones and geographical locations (Zaheed & Abeywickrema, 2021).

Sri Lankan government policies and strategies of agricultural development have centred on crop diversification and promotion of self-sustain, self-reliant, and prosperous transformation of the rural subsistence agriculture sector into profitable commercial ventures. Within the framework of programs designed to achieve these goals, farmers are actively encouraged to cultivate fruit crops, thereby optimizing the use of available land resources and creating an additional source of income (Udari *et al.*, 2016)

In the year 2019, Sri Lanka produced over 1 million metric tons of fruits (EDB, 2019), earning an income of US\$ 35.7 million. Fruits, contributing to 0.35% of merchandise exports in the year 2016 have been increasing steadily, implies the industry is expanding in the country. Therefore, the development of the fruit crop sector proved to be having the potential for foreign exchange earnings and savings.

Low fruit and vegetable consumption represents a significant risk factor contributing to the increasing prevalence of chronic diseases worldwide. However, Per capita fruit consumption in Sri Lanka falls below the recommended quantities advised by nutritionists. Medical experts suggest that each individual's daily diet should include a minimum of 100 grams of fruits. However, in Sri Lanka, per capita fruit consumption stands at a mere 40 grams per day (Rambukwella & Samantha, 2013).

Although fruit crop cultivation is practiced in an ad-hoc manner in Sri Lanka, there is a substantial potential for systematic fruit crop cultivation even in Non- traditional areas in Sri Lanka. By exploring the potential areas for fruit crop cultivation, it is possible to increase the productivity and national production of fruit crops. Therefore, an attempt was made to explore and map potential fruit [Mango (*Mangifera indica*), Banana (*Musa spp*, Pomegranate (*Punica granatum*), Pineapple (*Ananas comosus*), Rambutan (*Nephelium lappaceum*) and Durian (*Durio zibethinus*)] growing areas of Sri Lanka for the entrepreneurs who are interested in investing fruit crop sector, decision makers and the general public to

explore the potential areas for cultivating fruit crops.

Materials and Methods

Study Area and Climate

The study was carried out in the year 2022, encompassing the entire country of Sri Lanka as the study area. Climatic data (Annual average rainfall, daily minimum, and maximum ambient temperature), and soil information (type, depth drainage class, and texture) available in the Natural Resources Management Centre were employed in the research process.

This study adhered to the guidelines provided by Food and Agriculture Organization (FAO, 1976) to conduct the land assessment process. Topographic, soil, and climatic factors were used to evaluate the suitability of lands for fruit crops. Nine specific criteria were utilized for land suitability classification for fruit crops in Sri Lanka. These were selected based on existing literature and the views of local experts. These criteria encompassed soil-related factors (such as soil type, pH, soil depth, texture, and drainage pattern), topographical variables (including slope, elevation, and land use), and climatic factors (namely rainfall, relative humidity and temperature). The existing land use map was employed to identify areas with physical constraints that might hinder fruit crop cultivation. This information was instrumental in distinguishing potential areas by establishing connection between ranges and threshold values for other pertinent characteristics such as climatic, soil-related and terrain requirements,

which were used to determine crop suitability ratings.

The assessment of land suitability for fruit crops was conducted using Geographical Information Systems (GIS). This process aimed to compare the specific requirements of different fruit crops with suitability of soil characteristics in various land types (Baja *et al.*, 2001). Unique data pertaining to land qualities for fruit crop suitability were gathered from existing maps and information sources in Sri Lanka. These data include soil groups, landform, elevation, rainfall, and agro ecological data, all of which obtained from the Natural Resources Management Centre. These data were organized into distinct themes. The maps were then layered on top one another to identify regions that possessed most

favourable combination of soil and climate conditions for each fruit crop. Subsequently, the data was encoded into a GIS database, and the Simple Limitation Approach (SLA) was employed to generate preliminary land suitability maps and land suitability classes that aligned with the specific requirements each crop (Boonyanuphap *et al.*, 2004). To ensure accuracy, these tentative soil suitability maps were field-checked and compared with actual boundaries (Figure 1).

Considering the export potential Mango (*Mangifera indica*), Banana (*Musa spp.*), Pomegranate (*Punica granatum*), Pineapple (*Ananas comosus*), Rambutan (*Nephelium lappaceum*), and Durian (*Durio zibethinus*) were identified as suitable fruit crops for exploring potential areas.

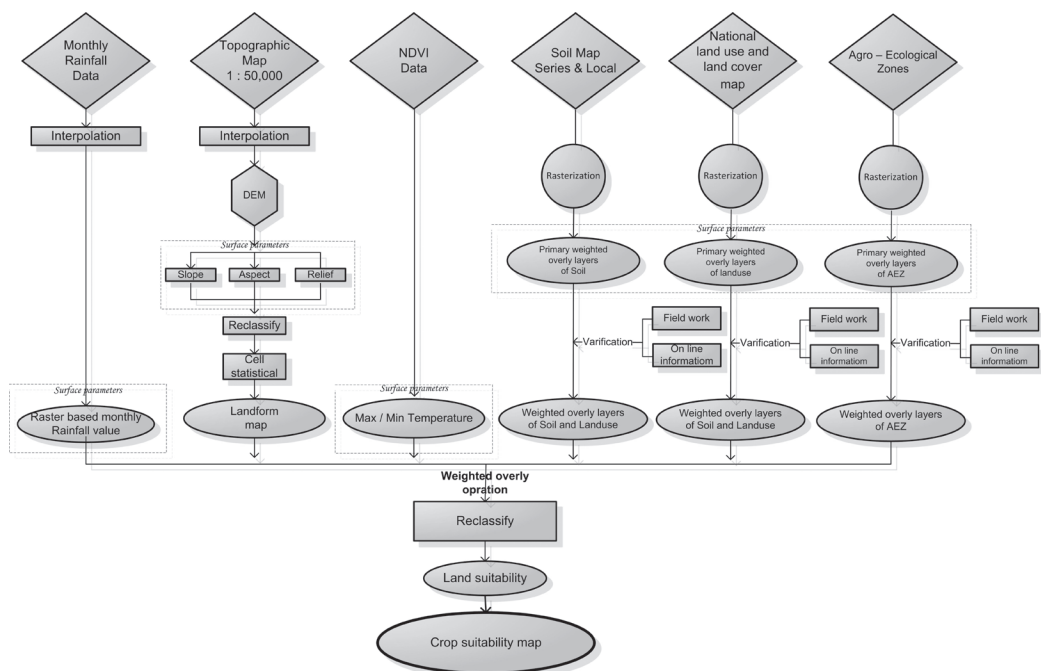


Figure 1. Flowchart of methodology for fruit crop suitability assessment

Classification of potential fruit growing areas

The potential fruit-growing areas were classified base no two major groups of parameters: Soil-related (such as soil type, soil depth, drainage class, and soil texture), Climatic parameters (Minimum and Maximum ambient temperature, rainfall amount, and distribution, and relative humidity (Table 1).

Classification approach for fruit growing

The fruit-growing areas were categorized into five classes: Highly suitable, Moderately suitable, Marginal suitable, Not suitable for commercial cultivation, and Unsuitable due to soil limitations. Lands that had already

been allocated for other purposes, including natural forests, wildlife sanctuary, paddy lands and those designated for buildings and other infrastructure development, were excluded from the preparation of the fruit crop suitability maps.

Results and Discussion

Banana (*Musa spp.*)

Banana is the only fruit crop in Sri Lanka that is available throughout the year, and its consumption rate is also higher than that of any other fruit (Ranathilaka *et al.*, 2018). The major districts for cultivating bananas in the country are Kurunagala, Rathnapua, Hambantota, Monaragala, Ampara, and Jaffna.

Table 1. Climatic and soil requirements of fruit crops

Crop	Soil pH	Soil depth (cm)	Optimum Temp. (°C)	Elevation Up to (m)	Rainfall	RH %
Banana	5.5-7.5	40-50	26-30	1500	75 mm/month	
Mango	5.5-7.2	200	27-36	1300	500-2500 mm/year. Need 2–3-month dry period /year	
pineapple	5-6	30-40	15- 30	1000		70% or above
Durian	5.5-6.5	200	24- 32	800	1500 mm-4000 mm/year	70% or above
Rambutan	5.5-6.5	200	24- 32	600	1500 mm-3000 mm/year	70% or above
Mangosteen	5.5-6.8	200	24- 32	600	1500 mm-3000 mm/year	70% or above
Pomegranate	5.5-6.0	150	23 - 32	500	500-800 mm/year	

Sources: Sherman and Beckman (2003), (DoA, 2022)

Potential fruit crop growing areas – Banana (Ambul, Anamalu, and Amban varieties)

Among the districts of Sri Lanka, Rathnapura recorded the highest percentage of highly suitable lands for Banana (Ambul, Anamalu, and Amban varieties) at (44.2%) followed by Matara district (43.1%). When considering highly, moderately, and marginally suitable lands together, Rathnapura district had the highest percentage of lands (47.3%) suitable for

Banana (Ambul, Anamalu, and Amban varieties) cultivation. When looking at the different divisional secretariat divisions in Sri Lanka, Maspotha in Kurunegala district and Kirinda-Puhulwella in Matara district recorded the highest percentage of lands suitable for Banana (Ambul, Anamalu, and Amban varieties) at 98% followed by Yatiyanthota divisional secretariat division of Kegalle district at 96% (Table 2, Figure 2).

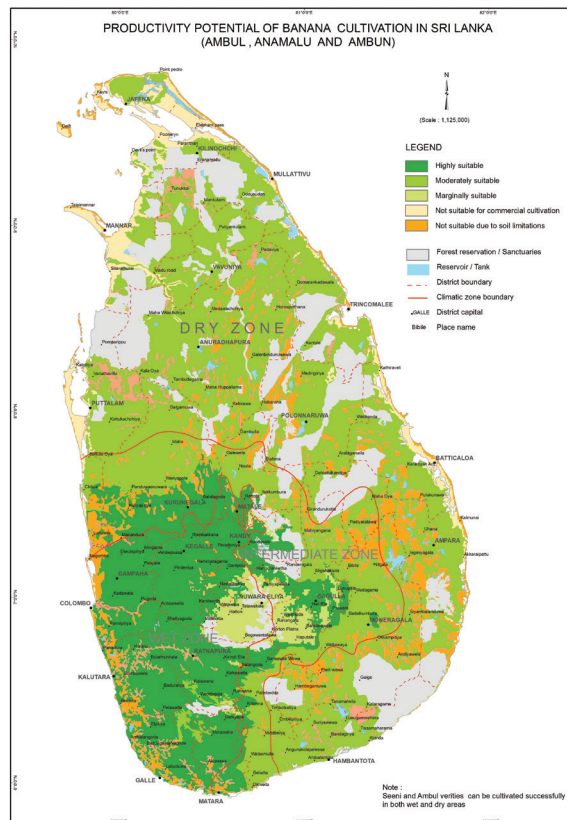


Figure 2. Productive potential of Wet zone adapted Banana varieties (Ambul, Anamalu and Amban) in Sri Lanka

Table 2. District-wise potential percentage extent Banana (Ambul, Anamalu and Amban)

District	District-wise potential percentage extent Banana (Ambul, Anamalu and Amban)				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Ampara	0	12.9	0	87.0	Alayadiwembu (45)
Anuradhapura	0	23.3	0	76.6	Nuwaragampalatha – East (87)
Badulla	2.6	22.7	17.0	57.6	Lunugala (56)
Batticaloa	0	4.2	0	95.7	Manmunai south and Eruvilpattu (10)
Colombo	29.1	0	0	70.8	Maharagama (83)
Galle	28.5	0	0	71.4	Niyagama (88)
Gampaha	41.2	0	0	58.7	Mahara (90)
Hambantota	19.6	12	0	68.3	Walasmulla (79)
Jaffna	1.4	28.9	0	69.6	Tellippalai (79)
Kalutara	31.1	0	0	68.8	Agalawatta (90)
Kandy	24.0	2.5	3.8	69.5	Deltota (80)
Kegalle	35.7	0	1.9	62.3	Yatyanthota (96)
Killinochchi	0	5.6	0	94.3	Pachchipalai (8)
Kurunegala	14.2	16.7	0	69.0	Maspotha (98)
Mannar	0	13.0	0	87.0	Musalai (43)
Mathale	19.5	14.6	1.3	64.3	Ambanganga Korale (74)
Matara	43.1	3.5	0.3	52.9	Kirinda - Puhulwella (98)
Moneragala	4.5	2.7	0.1	92.5	Badalkumbura (23)
Mulattivu	0	3.7	0	96.2	Maritime Pattu (8)
Nuwara Eliya	10.6	11.6	1.2	76.6	Ambagamuwa (40)
Polonnaruwa	0	12.2	0	87.7	Hingurakgoda(18)
Puttalam	3.2	7.0	0	89.6	Madampe (24)
Ratnapura	44.2	0.1	2.9	52.6	Opanayaka (95)
Trincomalee	0	9.9	0	90.1	Morawewa (15)
Vavniya	0	9	0	91	Vavunia South (19)

**Potential fruit crop growing areas
- Banana (Kolikuttu, Seeni, and
Cavendish) varieties**

Among the districts of Sri Lanka, Puttalam (43.3%) recorded the highest percentage of highly suitable lands for Banana (Kolikuttu,

Seeni, and Cavendish varieties) followed by Jaffna district (36.8%). Considering highly, moderately and marginally suitable lands together, the district of Kegalle recorded the highest percentage of lands (73.3%) suitable for Banana (Kolikuttu, Seeni and

Cavendish varieties) cultivation. Among the different divisional secretariat divisions of Sri Lanka, Maspota in Kurunegala district and Kirinda-Puhulwella in Matara district recorded the highest percentage (98%)

of lands suitable for Banana (Kolikuttu, Seeni and Cavendish varieties) cultivation followed by Ruwanwella divisional secretariat division (91%) of Kegalle district. (Table 3, Figure 3).

Table 3. District wise potential percentage extent Banana (Kolikuttu, Seeni and Cavendish)

District	District wise potential percentage extent Banana (Kolikuttu, Seeni and Cavendish)				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Ampara	20.9	0.0	0.0	79.0	Ampara (41)
Anuradhapura	33.6	0.0	0.0	66.3	Palugaswewa (60)
Badulla	32.5	8.5	9.1	49.7	Haputhale (89)
Batticaloa	25.2	0.0	0.0	74.8	Manmunai West (62)
Colombo	1.5	28.6	0.0	69.8	Maharagama (66)
Galle	17.3	6.4	0.0	76.1	Elpitiya (66)
Gampaha	13.9	36.4	0.0	49.6	Mahara , Mirigama Biyagama (78)
Hambantota	23.2	10.5	28.8	37.3	Katuwana (84)
Jaffna	36.8	0.1	2.3	60.6	Uduvil (82)
Kalutara	19.8	4.8	0.0	75.3	Bulatsinhala (82)
Kandy	12.8	35.1	0.0	51.9	Delthota (86)
Kegalle	20.7	52.6	0.0	26.7	Ruwanwella (91)
Killinochchi	7.0	0.0	0.0	93.0	Poonakary (7)
Kurunegala	21.6	28.7	0.2	49.3	Rideegama (79)
Mannar	8.0	0.0	0.0	92.0	Manthai West (12)
Mathale	17.2	20.3	17.2	45.2	Ukuwela (81)
Matara	11.3	32.1	1.8	54.6	Pitabeddara, Dikwella (79)
Moneragala	25.6	0.0	10.0	64.3	Sewanagala (71)
Mulattivu	14.0	0.0	0.0	86.0	Maritimepattu (18)
Nuwara Eliya	22.0	1.0	0.0	77.0	Ambagamuwa (65)
Polonnaruwa	21.0	0.0	0.0	79.0	Elahera (27)
Puttalam	43.3	2.9	0.0	53.7	Pallama (83)
Ratnapura	31.2	14.1	3.5	51.1	Eheliyagoda, Elapatha, Kiriella (80)
Trincomalee	19.1	0.0	0.0	80.9	Padavi Sri Pura (44)
Vavniya	17.5	0.0	0.0	82.5	Vavniya (21)

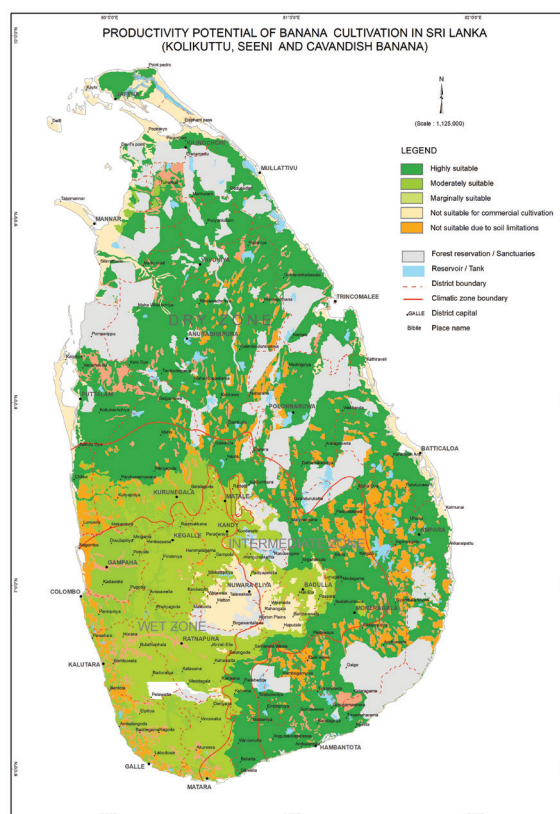


Figure. 3. Productive potential of Banana varieties of Kolikuttu, Seeni kesel and Cavendish in Sri Lanka

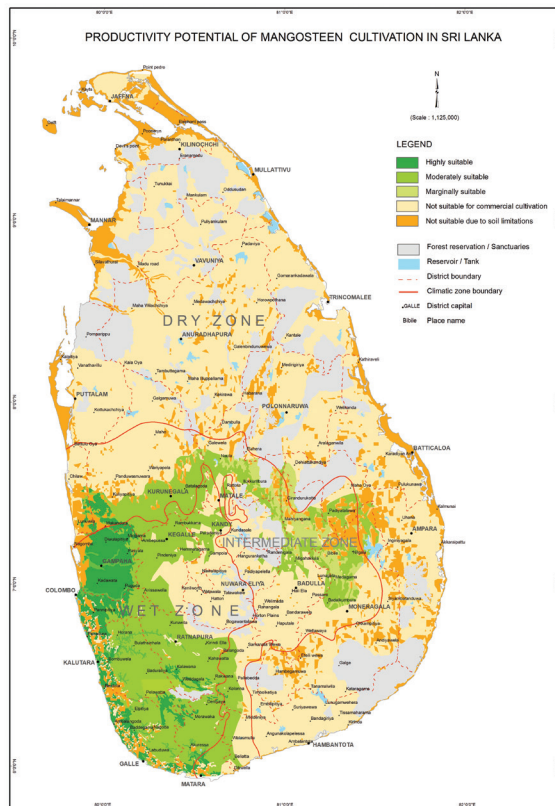
Potential fruit crop growing areas - Mangosteen

Among the districts of Sri Lanka, Gampaha (37.3) recorded the highest percentage of highly suitable lands for Mangosteen followed by Colombo (33.5%). However, when considered highly, moderately, and marginally suitable lands together, the district of Kegalle recorded the highest percentage of lands (67.1%) suitable for Mangosteen cultivation. Among the

different divisional secretariat divisions of Sri Lanka, Dehiowita in Kegalle recorded the highest percentage (94%) of lands suitable for Mangosteen cultivation followed by Godakawela divisional secretariat division (83%) of Rathnapura district. Nuwara Eliya district was having the highest percentage (96.5%) of lands unsuitable for Mangosteen cultivation (Table 4, Figure 4.).

Table 4. District wise potential percentage extent of Mangosteen

District	District wise potential percentage extent Mangosteen				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Badulla	0.0	16.7	1.6	81.7	Kandekatiya (58)
Colombo	33.5	2.2	0.0	64.1	Maharagama (67)
Galle	17.5	16.8	0.0	65.5	Yakkalamulla (78)
Gampaha	37.3	13.0	0.0	49.6	Mahara, Biyagama, Atthanagalla (78)
Kalutara	9.8	30.0	0.0	60.0	Bulathsinhala (82)
Kandy	0.0	27.8	1.7	70.4	Hatharaliyadda (82)
Kegalle	0.1	67.0	0.0	32.8	Dehiowita (94)
Kurunegala	1.3	38.0	0.1	60.5	Mawathagama (77)
Mathale	0.0	18.4	3.5	78.1	Pallepola (71)
Matara	1.8	42.5	0.0	55.3	Hakmana (79)
Moneragala	0.0	11.0	3.7	85.2	Badalkumbura (31)
Nuwara Eliya	0.0	1.0	2.5	96.5	Kothmale (6)
Ratnapura	0.2	45.1	0.0	54.5	Godakawela (83)

**Figure. 4 Productive potential of Mangosteen in Sri Lanka**

Potential fruit crop growing areas - Mango

Present extent under mango in Sri Lanka is about 27,500 Ac. Predominately, it is grown in Kurunegala, Anuradhapura, Hambanthota, Puttalam, Moneragala, Jaffna districts. As a fresh fruit, mango has a high demand in international and local markets.

Since there are two types of mango varieties suitable for dry/intermediate zones (Karthakolomban, Villard, Tom EJC and Malwana) and wet zones (Velleikolomban, Gira amba, Horana hiru and Dampara) of Sri Lanka two separate crop suitability maps were prepared to cater the varieties suitable for both wet and dry/intermediate zones.

Mango (Dry and Intermediate Zone adapted varieties)

Among the districts of Sri Lanka, Anuradhapura (45.81%) recorded the highest percentage of highly suitable lands for Mango followed by Jaffna district (30.54%). However, considering highly, moderately and marginally suitable lands together, district of Rathnapura recorded the highest percentage of lands (59.8%) suitable for Mango cultivation. Among the different divisional secretariat divisions of Sri Lanka, Galenbindunuwewa in Anuradhapura district recorded the highest percentage (87%) of lands suitable for Mango cultivation followed by Udubaddawa divisional secretariat division (85%) of Rathnapura district. (Table 5, Figure 5).

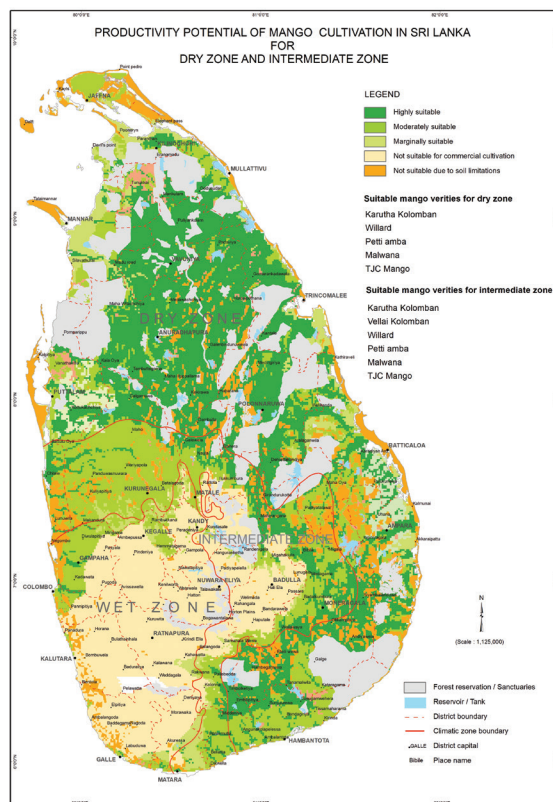


Figure 5. Productive potential of Mango (Dry and intermediate Zone adapted varieties) in Sri Lanka

Table 5. District wise potential percentage extent of Mango (Dry and Intermediate Zone adapted varieties)

District	District wise potential percentage extent Mango - Dry and Intermediate Zone				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Ampara	9.8	8.7	6.7	74.6	Maha-Oya (52)
Anuradhapura	45.8	0	0	54.1	Galenbindunuwewa (87)
Badulla	18.4	29.2	4.4	48.0	Kandekatiya (79)
Batticaloa	8.1	10.0	4.8	77.0	Manmunai – West (34)
Gampaha	1.0	0	12.6	86.3	Negambo (25)
Hambantota	14.1	33.5	5.3	46.9	Weeraketiya (78)
Jaffna	30.5	1.9	0.1	67.4	Tellipallai (54)
Kandy	14.0	30.0	2.0	54.0	Minipe (46)
Killinochchi	4.5	3.0	0	92.5	Poonakari (8)
Kurunegala	16.3	28.8	9.9	44.8	Udubaddawa (85)
Mannar	4.7	2.7	2.2	90.2	Manthai-West (15)
Mathale	29.8	11.8	0	58.4	Galewela (61)
Matara	6.2	21.2	0	72.5	Hakmana (80)
Moneragala	29.2	9.8	0	61	Sewanagala (73)
Mulattivu	10.0	5.5	0	84.5	Pudukuduirippu (19)
Polonnaruwa	26.2	1.7	0	72.0	Lankapura (56)
Puttalam	22.4	16.4	0	61.2	Pallama (84)
Ratnapura	14.0	26.8	0	59.2	Weligepola (81)
Trincomalee	23.4	3.2	0	73.2	Padavi-Sripura (44)
Vavniya	21.0	0	0	79.0	Vavunya (26)

Mango (Wet Zone adapted varieties)

Among the Mango cultivable districts of Sri Lanka, Gampaha (58%) recorded the highest percentage of highly suitable lands for Mango followed by Colombo district (43.8%). However, when considered highly, moderately, and marginally suitable lands together, the district of Matara recorded the

highest percentage of lands (74.3%) suitable for Mango cultivation. Among the different divisional secretariat divisions of Sri Lanka, Dehiowita in Kegalle district recorded the highest percentage (96%) of lands suitable for Mango cultivation followed by Udapalatha divisional secretariat division (90%) of Kandy district. (Table 6, Figure 6).

Table 6. District wise potential percentage extent of Mango (Wet Zone adapted varieties)

District	District wise potential percentage extent Mango - Wet Zone				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Badulla	0	0	5	95	Welimada (5)
Colombo	43.8	10.3	0.5	45.4	Hanwella (87)
Galle	22.8	23.1	3.0	51.0	Yakkalamulla (82)
Gampaha	58.0	4.8	0.2	36.8	Dompe (84)
Hambantota	11.5	25.5	0	63.0	Walasmulla (40)
Kalutara	18.8	43.1	0	37.9	Bulathsinhala (86)
Kandy	0	19.1	42.6	38.2	Udapalatha (90)
Kegalle	0.1	43.3	30.4	25.8	Dehiowita (96)
Kurunegala	1.1	13.3	13.8	71.3	Alawwa (61)
Mathale	6.5	20	14.1	59.3	Ukuwela (67)
Matara	0.3	69.0	5.0	25.6	Pitabaddara (83)
Nuwara Eliya	0	0.7	30.7	68.5	Ambagamuwa (69)
Puttalam	5.0	0	0	95.0	Dankotuwa (5)
Ratnapura	1.4	48.4	2.6	47.2	Ayagama (85)

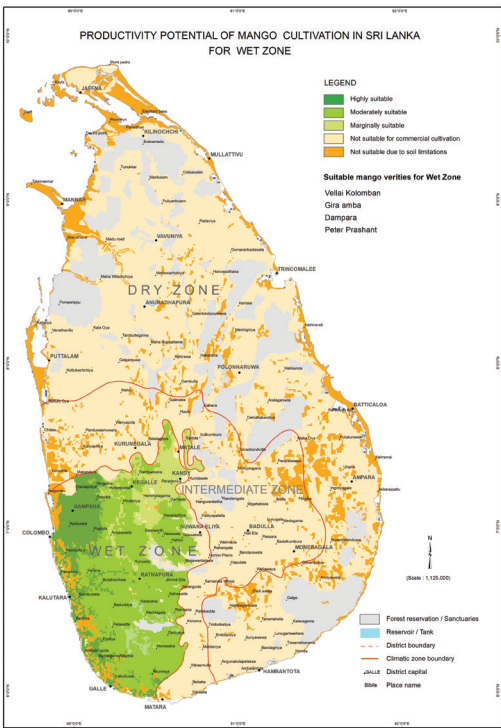


Figure 6. Productive potential of Mango (Wet Zone adapted varieties) in Sri Lanka

Potential fruit crop growing areas -

Pineapple (*Ananas comosus*)

Pineapple is a fruit crop belonging to the family Bromiliceae originated in Brazil and is cultivated worldwide popularly intercropped with coconut and about 90% of the pineapple in the country was grown within the 'coconut triangle'. The total extent of pineapple in Sri Lanka is about 4,750 hectares producing a total of 35,000 t/year, 70% of which is produced in the Kurunegala and Gampaha districts. The common variety grown here is 'Mauritius', which is a 'Queen' type with spiny leaves, golden-yellow flesh colour of the fruit with an excellent flavour.

Among the Pineapple cultivable districts of Sri Lanka, Gampaha (53.5%) recorded the highest percentage of highly suitable lands for pineapple followed by Kandy district (50.8%). However, when considered highly, moderately and marginally suitable lands together, district of Jaffna recorded the highest percentage of lands (84%) suitable for pineapple cultivation. Among the different divisional secretariat divisions of Sri Lanka, Weligama in Matara district recorded the highest percentage (98%) of lands suitable for Pineapple cultivation followed by Kahawatta divisional secretariat division (92%) of Rathnapura district. (Table 7, Figure 7).

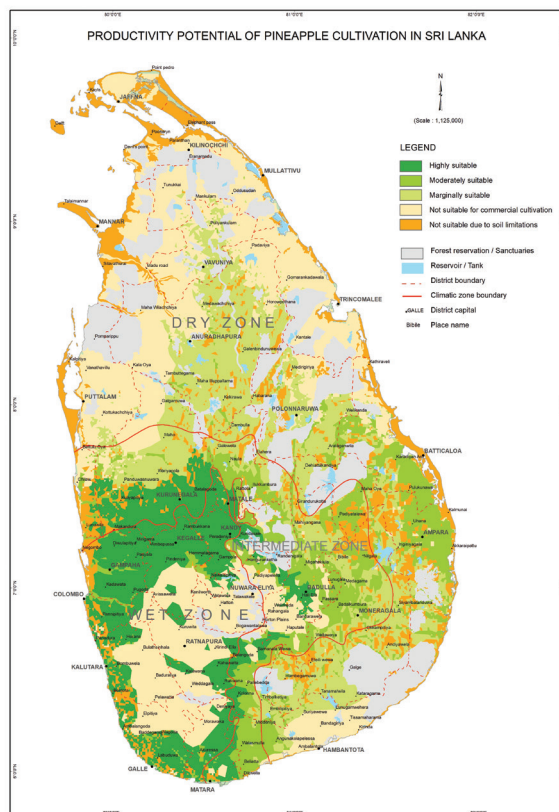


Figure 7. Productive potential of Pineapple in Sri Lanka

Table 7. District wise potential percentage extent of Pineapple

District	District wise potential percentage extent - Pineapple				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Ampara	0	2.5	16.1	81.2	Eragama (88)
Anuradhapura	0	0	1.6	98.3	Thambuththegama (3)
Badulla	13.0	6.6	16.2	64.0	Soranathota (83)
Batticaloa	0	0	14.6	85.3	Manmunai West (23)
Colombo	47.8	0	0.1	52.0	Sri Jayawardhanapura Kotte (90)
Galle	30.6	0	0.1	69.1	Yakkalamulla (71)
Gampaha	53.5	0	0.1	46.3	Minuwangoda (90)
Hambanthota	16.5	33.2	1.8	48.3	Walasmulla (77)
Jaffna	5.0	68.0	11.0	16.0	Chavakachcheri (84)
Kalutara	23.7	0	0.6	75.6	Horana (59)
Kandy	50.8	5.5	6.0	37.5	Thumpane (89)
Kegalle	58.0	1	2.7	38.3	Galigamuwa (90)
Kurunegala	39.8	1.1	2.1	56.9	Narammala (80)
Matale	25.6	15.6	7.1	51.5	Ukuwe;a (87)
Matara	45.2	3.2	1.2	50.2	Weligama (98)
Moneragala	0	13.9	5.1	80.9	Badalkumbura (66)
Nuwareliya	15.0	0.2	32.5	52.2	Walapane (88)
Polonnaruwa	0	6.6	1.3	92.0	Elahara (40)
Puttlam	16.3	0	1.2	82.3	Dankotuwa (79)
Rathnapura	34.5	12.7	0.9	51.8	Kahawatta (92)
Vavunia	0	0	1.0	99.0	Vavunia (1)

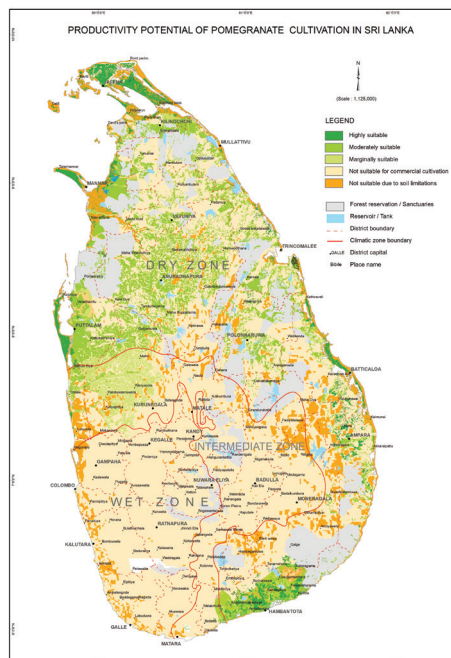
The productive potential of - (*Punica granatum*) in Sri Lanka

The pomegranate (*Punica granatum*) is a fruit-bearing deciduous shrub in the family *Lythraceae*. Among the pomegranate cultivable districts in Sri Lanka, Vavunia (5.2%) recorded the highest percentage of highly suitable lands for pomegranate followed by Ampara district (3.2%). However, when considered highly, moderately and marginally suitable lands together, district of Vavunia also recorded

the highest percentage of lands (33.8%) suitable for pomegranate cultivation. Among the different divisional secretariat divisions of Sri Lanka, Vengalcheddikulam in Vavunia district recorded the highest percentage (77%) of lands suitable for Pomogranate cultivation followed by Nuwaragampalatha East divisional secretariat division (73%) of Anuradhapura district. (Table 8, Figure 8).

Table 8. District wise potential percentage extent of Pomegranate

District	District wise potential percentage extent Pomegranate				DS division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Ampara	3.2	5.0	0.5	91.1	Addalachchenai (30)
Anuradhapura	0.1	33.1	0	66.6	Nuwaragampalatha East (73)
Batticola	0.4	0.8	1.0	97.7	Manmunai SW, Oddamawadi (4)
Hambantota	0.7	0.8	0.1	98.2	Tangalle (3)
Jaffna	1.0	0.0	0.3	98.6	Chavakachcheri (2)
Kegalle	0.0	0.0	1.0	99.0	Warakapola (1)
Killinochchi	0.5	19.5	0.0	80.0	Poonakari (39)
Kurunegala	0.0	7.3	10.4	82.2	Ambanpola (67)
Mannar	1.2	4.0	0	94.8	Manthai West (15)
Mathale	0.0	1.0	0	99.0	Wilgamuwa (1)
Moneragala	0.4	0.8	0	98.8	Buttala (2)
Mulattivu	0.5	10.5	0	89.0	Maritime Pattu (21)
Polonnaruwa	0.2	8.0	0.2	91.4	Medirigiriya (22)
Puttalam	1.5	9.5	3.5	85.4	Puttalam (70)
Ratnapura	1.0	1.0	0	98.0	Ambilipitiya (2)
Trincomalee	0.7	16.5	0.5	82.2	Padavi Sripura (44)
Vavniya	5.2	28.6	0	66.2	Vengalcheddikulam (77)

**Figure 8. Productive potential of Potential cultivation areas of Pomegranate in Sri Lanka**

Potential fruit crop growing areas - Rambutan (*Nephelium lappaceum*)

Among the Rambutan cultivable districts of Sri Lanka, Gampaha (37.3%) recorded the highest percentage of highly suitable lands for pomegranate followed by Colombo district (33.5%). However, when considered highly, moderately and marginally suitable lands together, district of Kegalle recorded the highest percentage of lands (67.18%) suitable for pomegranate cultivation.

Among the different divisional secretariat divisions of Sri Lanka, Dehiovita in Kegalle district recorded the highest percentage (94%) of lands suitable for Rambutan cultivation followed by Bulathsinhala divisional secretariat division of Kalutara district and Godakawela in Rathnapura district (82%). (Table 9, Figure 9).

Table 9. District wise potential percentage extent of Rambutan

District	District wise potential percentage extent Rambutan				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Badulla	0	16.7	1.6	81.7	Kandeketiya (52)
Colombo	33.5	2.2	0	64.2	Maharagama (67)
Galle	17.6	16.8	0	65.6	Yakkalamulla (78)
Gampaha	37.3	13.0	0	49.6	Mahara, Biyagama, Atthanagalla (78)
Kalutara	9.8	30.0	0	60.2	Bulathsinhala (82)
Kandy	0	27.8	1.7	70.4	Hatharaliyadda (78)
Kegalle	0.1	67.0	0	32.8	Dehiovita (94)
Kurunegala	1.2	36.1	0.1	62.4	Mawathagama (77)
Mathale	0	18.4	3.5	78.1	Pallepola (71)
Matara	1.71	42.2	0	56.0	Hakmana (79)
Moneragala	0	11.0	3.7	85.2	Badalkumbura (31)
Nuwara Eliya	0	1.0	2.5	96.5	Kothmale (6)
Ratnapura	0.2	45.1	0.1	54.5	Godakawela (82)

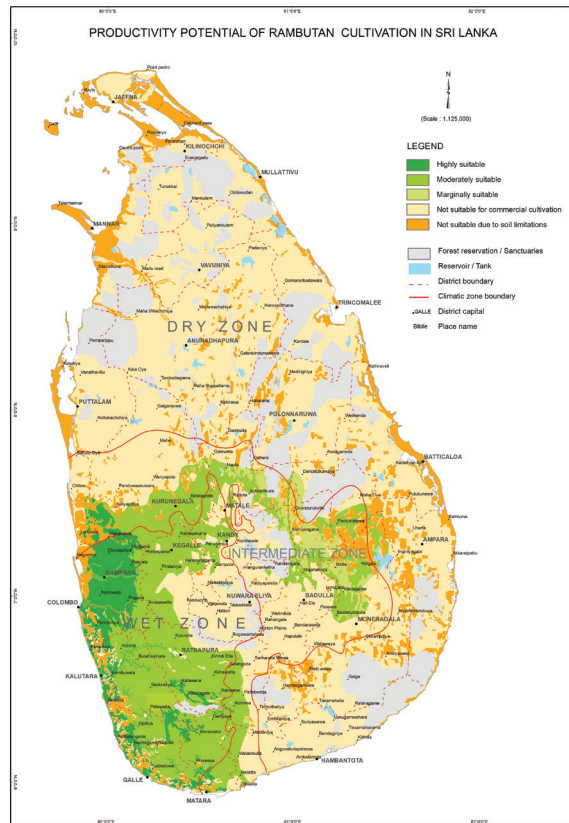


Figure 9. Productive potential of Rambutan in Sri Lanka

Potential fruit crop growing areas - Durian (*Durio zibethinus*)

Among the Durian cultivable districts of Sri Lanka, Gampaha (37.3%) recorded the highest percentage of highly suitable lands for pomegranates followed by Colombo district (33.5%). However, when considering highly, moderately, and marginally suitable lands together, the

district of Kegalle recorded the highest percentage of lands (65.5%) suitable for Durian cultivation. Among the different divisional secretariat divisions of Sri Lanka, Dehiwita in the Kegalle district recorded the highest percentage (94%) of lands suitable for Durian cultivation. (Table 10, Figure 10).

Table 10. District wise potential percentage extent of Durian

District	Average of extent by divisional secretariat Durian				Divisional Secretariat division having highest potential area percentage in the district (Highly + Moderately + Marginally suitable)
	Highly suitable	Moderately suitable	Marginally suitable	Not suitable	
Badulla	0	16.7	1.6	81.7	Kandeketiya (58)
Colombo	33.5	2.2	0	64.2	Maharagama (57)
Galle	17.5	16.9	0	65.6	Yakkalamulla (78)
Gampaha	37.3	13.0	0	49.6	Biyagama, Aththanagalla, Mahara (78)
Kalutara	9.8	30.0	0	60.2	Bulathsinhala (83)
Kandy	0	27.8	1.7	70.4	Hatharaliyadda (78)
Kegalle	0.2	65.3	0	34.4	Dehiovita (94)
Kurunegala	1.3	38.0	0.1	60.5	Mawathagama (77)
Mathale	0	18.4	3.5	78.1	Pallepola (71)
Matara	1.7	42.2	0	55.9	Hakmana (79)
Moneragala	0	11.0	3.7	85.2	Badalkumbura (31)
Nuwara Eliya	0	1.0	2.5	96.5	Kothmale (6)
Ratnapura	0.2	45.2	0.1	54.5	Godakawela (83)

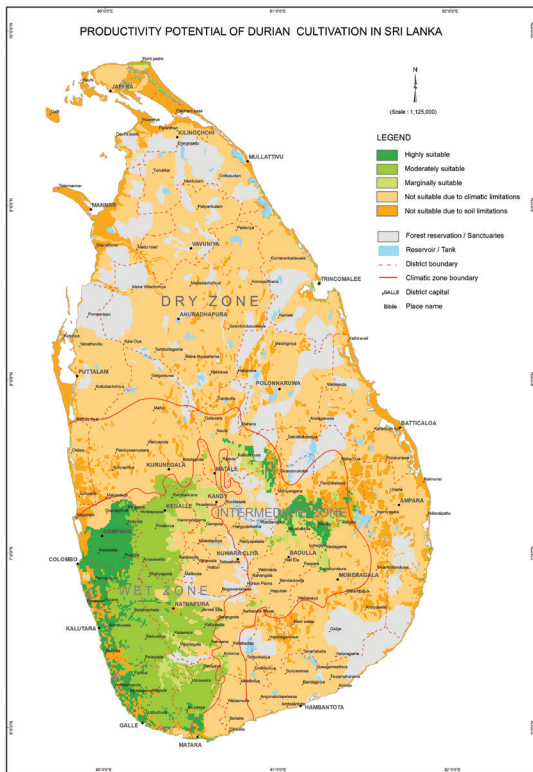


Figure 10. Productive potential of Durian in Sri Lanka

Conclusions

Among the evaluated fruit crop varieties, Sri Lanka is primarily suitable for banana cultivation, with all varieties covering 34.7% of land area. Mango cultivation (all varieties combined) follows closely at 29.4%. Pomegranate cultivation, on the other hand, is limited to very small portion of land (0.97%) in Sri Lanka. Nevertheless, there is a considerable extent of moderately suitable land available in non-conventional districts for fruit crop cultivation.

While some districts exhibit low district-wise crop suitability, certain divisional secretariat divisions within these districts, showed suitability for specific fruit crops, highlighting regional variation in crop suitability. It is worth noting that a significant proportion of the land is categorized for fruit crop cultivation due to reservations for forests, paddy cultivation, and infrastructure development, rather than being limited by actual climatic and soil constraints.

Based on the crop suitability evaluation, there is a need to harness the available potential lands for fruit crop cultivation, using improved technologies to meet the demands of both the export market and local markets. Some lands classified as "Not suitable due to soil limitations" may become suitable for fruit crop cultivation after addressing these soil limitations. Therefore, a thorough examination of these lands is necessary to explore the possibility of correction of these limitations, which could extend potential cultivation areas for fruit crops.

The suitability maps for fruit crops were developed using existing climatic parameters, soil data, and crop recommendations provided by the Department of Agriculture. To address the account for variation in climatic parameters and updates in crop recommendations, it is advisable to periodically revise these fruit crop suitability maps.

To fully realize the potential of climatic and soil parameters, it's essential to optimize other factors such as input (fertilizer, irrigation, etc.) and management practices that influence the success of fruit crop cultivation.

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