CHAPTER III
AGROCLIMATIC ADVANTAGES OF KERALA

Though Kerala accounts for only 1.18 per cent of the total land area of India, a large variety of crops of commercial significance are grown in the state.¹

The state has a long coastal belt, a mountainous range and a vast mid region. A very wide range of soil types are found in the state ideally suited for many crops of diverse nature. The coastal belt itself has distinctly different soils like lateritic, alluvial and sandy loam. According to agro-meteorologists what constitutes a unique agro-climatic region are total rainfall in the area, annual distribution of rainfall, temperature conditions and the amount of sunshine.² Kerala has abundant rainfall, sunshine and a range of temperature to suit the different crops grown.

The Crop Pattern:

Kerala has a wide spectrum of plantation crops unlike in any other part of the country. Tropical crops like coconut,

rubber, pepper, arecanut are grown extensively in the state as tropical agro-climatic conditions prevail in major part of the area. Coffee and tea are grown in the sub-tropical regions in the hilly areas. For many centuries past, a wide range of spices crops have been grown in the state winning it the fame as the 'Land of Spices'. Pepper, cardamom, ginger, turmeric, cloves, cinnamon and nutmeg thrive very well under the eco-geographical conditions prevalent here. Many of the crops successfully grown in the state are of exotic origin. Tea, coffee, rubber, cashew, tapioca and cocoa are some of the crops of exotic origin which have thrived on the congenial eco-physical, agro-climatic and socio-economic conditions available in the state accounting for the largest area under most of these crops in the whole country. The distinct agro-climatic advantages which made some of the important commercial crops uniquely successful in Kerala are examined below in detail to identify the specific positive factors which led to the situation.

**Coconut (Cocos nucifera)**

Coconut palm has been known to exist in the country since 3,000 years. The coastal belt of Kerala provides the optimum eco-physiological factors for the successful cultivation of coconut. Before the dispersion of coconut cultivation to neighbouring States, Kerala accounted for more than 70 per cent of the total area under the crop in the country.  

1981-82 the State had an area of 667,800 hectares under coconut which formed 62 per cent of the total area under the crop in India. The coconut growing areas in Kerala have soils which are broadly categorized as sandy loam, alluvial and lateritic. The coastal belt have soils which are well drained and possessing good water holding capacity. Coconut is a crop which requires abundant sunshine and a well distributed rainfall. The South West and North East monsoon and the intervening summer have considerably helped in the successful establishment of the crop in the state. Basically the potential for extensive coconut cultivation in the state was derived from the congenial climatic factors prevalent here.

Rubber (Hevea brasiliensis)

Originated in Brazil Rubber was introduced into Kerala on commercial scale of cultivation by the British planters in 1902. Since then the crop has extended to vast areas in the state. Today Kerala is the largest rubber growing state in India with a total planted area of 2.5 lakhs hectares under the crop which is equivalent 86.6 per cent of the total area under rubber in India. More than the eco-geographical factors it was the socio-economic factors which helped the significant extension of rubber cultivation in the state. Being a tropical crop rubber thrives very well in the laterite loamy soils of Kerala

5 Rubber Board, Kottayam.
with abundant sunshine and a rainfall which is more than the actual requirement of the crop. In the present context it is more appropriate to increase the yield per hectare of the cropped area by intensive agronomic practices maximising the climatic and edaphic factor endowments.

**Cashew (Anacardiaceae occidentale)**

Cashew is a crop of Brazilian origin. It was introduced into Kerala by the Portuguese about four centuries ago. A hardy tropical plant cashew soon established successfully in the state. Today Kerala is the largest single state growing cashew with an area of 147,363 hectares under the crop. It is equivalent to more than 30 per cent of the total area under cashew cultivation in India. While cashew cultivation has now dispersed widely to other states in India, Kerala has the highest yield per hectare. This high productivity is the result of the favourable agro-climatic conditions in the state.

**Cocos (Cocos nucifera)**

The crop which is of South American origin was only recently introduced into Kerala. The largest area under cocoa in the country is in Kerala where it is grown as a mixed crop in

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coconut and arecanut gardens. The cultivation of cocoa has proved to be such a phenomenal success that there was a problem of disposal of the surplus production. Being a crop of the humid tropics cocoa found Kerala as an ideal habitat which caused the spontaneous success in the production of the crop.

Cocoa thrives well with a rainfall well spread and ranging from 150-200cm. annually. It tolerates a temperature from 150°C to a maximum of 40°C.\(^8\) Temperature around 25°C is considered ideal. It grows on loose soils allowing root penetration, movement of air and retention of moisture. The clay loams and sandy loams in Kerala are ideal substrata for cocoa.

**Pepper (Piper nigrum)**

Pepper is the most important and earliest known spice cultivated in Kerala. More than 90 per cent of the total production of pepper in the country is from Kerala. A crop of the humid tropics pepper thrives well under the agro-climatic conditions of the state. Being a wind pollinated crop it depends heavily on the monsoon for fruit bearing. An annual rainfall of 250cm. is considered ideal for the crop.\(^9\) It thrives best on forest soils or loamy soils with humus content. The temperature range ideally suited for pepper is between 10\(^\circ\)C to 40\(^\circ\)C.

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What made pepper to establish successfully in Kerala is the ideal agro-climatic conditions prevalent here.

A large number of cultivars of pepper have naturally evolved under the ecological and climatic system in the pepper growing areas in the state. This establishes the congeniality of the various factors for successful cultivation of pepper in the state. The future strategy of production of pepper has to be based on higher productivity. There is hardly any scope for further extension of area under the crop. Hence it is imperative to employ agro-techniques like selective breeding of high yielding varieties and optimal utilization of inputs to maximise productivity making use of the abundant climatic and ecological advantages for the crop in the State.

**Cardamom (Elettaria cardamomum)**

Kerala which accounts for 63 per cent of the total registered area under cardamom cultivation in India has been recognised by botanists as the natural habitat of the smaller type of cardamom known by the scientific name *Elettaria cardamomum*. The hills in the Western Ghats north of Thamparpani river were being referred to as the cardamom hills of Travancore. The scientific name *Elettaria* has been derived from the Malayalam word 'Elettari' by Maton who segregated in 1810 as 'Malabar cardamom' distinct from Amomium cardamom.  


What constituted the 'cardamom hills of Travancore' to be the home of smaller cardamom are the unique eco-geographical and agro-climatic conditions prevailing in the region. The cardamom produced in the state has certain distinct characteristics like colour, flavour and fragrance which have created a specific market demand for it. This advantage could be maximised by selective propagation and scientific agro-techniques.

Ginger (Zingiber officinale)

One of the oldest spices grown in Kerala, ginger is the third important spice exported from the state. An area of 12,360 hectares are under the crop in the state annually producing 30,480 metric tonnes of ginger. Ginger is said to have had its origin in Kerala. However, there are other investigators attributing its origin to China or South East Asia.

Ginger grows best in warm and humid climate upto an altitude of 1,500 metres. It needs heavy and well distributed rainfall and thrives well in soils with good drainage. The different types of soils in the ginger growing track in the state range from sandy loam, lateritic loam, to clayey loam. Almost the entire quantity of dry ginger exported from the country is of Kerala origin. The distinct features of ginger produced in Kerala are its high volatile oil content and strong

Pungent taste. These characteristics make the product distinct from those produced in other states. Further, the low moisture content and lower fibre content of Kerala ginger have created a specific export market demand for it. The varietal characteristics of the ginger cultivated in Kerala in combination with compatible agro-climatic conditions prevalent in the state are determinants of the distinct features of quality of the product. In view of the increasing competition from other producing countries in the world the position could be sustained only through an appropriate production strategy to further improve the distinct quality features of the ginger produced in Kerala. This could be done by evolving cultivars with desired characteristics as low fibre, low moisture, high oleoresin, high pungency, buff colour etc. Expansion of export trade in ginger largely depends upon the improvement of quality of the product.

_Turmeric (Curcuma longa)_

A tropical herb, turmeric has been successfully grown in the state for many centuries. Turmeric is believed to have originated in the Malabar coast. It thrives well in rich loamy soil with good drainage. Though Kerala has only the 7th position in the production of turmeric in the country, the varieties grown in the state have good export market demand. The entire quantity of the variety known as 'Alleppey turmeric' grown in

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the state is exported. The quality factor of this variety responsible for the specific demand in the export is the high curcumin content. As in the case of ginger it is the distinct features of the turmeric produced in Kerala which have to be further improved to expand the exports of this item. Evolving varieties with desired characteristics and maximising the edaphic and climatic benefits would be the right strategy for future.

Clove, Cinnamon and Nutmeg (Eugenia caryophyllus) (Cinnamomum zeylanicum) (Myristica fragrans)

It was the pioneering efforts of the British East India Company which introduced into India the spice crops of clove, cinnamon and nutmeg. These crops were first grown in the 'spice garden' at Courtallam in Tamil Nadu. In 1767 a spice estate in Anjarakandy in North Malabar was established which later won the fame as the largest single estate in the world for cinnamon.

According to the survey conducted by the Indian Council of Agricultural Research, hill regions of South West of India ranging from 300-900 metres above sea level covering parts of Kerala, Tamil Nadu and Karnataka are suitable for clove cultivation. In the earlier days clove was grown in the southern

15 Ibid.
17 Mahindru, S.N., Spices in Indian Life (1966), pp.143-144.
Region of the erstwhile Travancore state and the slopes of the western ghats of the former Cochin state. The crop is found to thrive in the black loamy forest soils but grows satisfactorily on laterite loams and clay loams as well. It is strictly a tropical plant requiring a warm humid climate. It is these agro-climatic conditions which helped the expansion of clove cultivation in Kerala. Today the state accounts for the largest area under clove in the country with an extent of 600 hectares approximately. As clove is at present imported to meet the domestic demand there is significant economic potential for the development of the crop in the state.

Kerala has the largest area in the country under cinnamon cultivation. It is considered to have had its origin in the Malabar coast and Ceylon, though cultivation on plantation scale was started in 1767 by the British planters. It is grown in a wide range of soils with an admixture of humus. Annual rainfall of 200-250cm. is ideally suited for the crop. The quality of the bark of the tree which is the product of commercial importance is influenced by the edaphic and ecological factors.

Production of cinnamon in the country is insufficient to meet the internal demand. Hence the requirement is met

19 Clove, Directorate of Cocoa, Areca nut and Spices Development (1979), pp.1-2.
through imports of cinnamon and cassia. Only *Cinnamomum zevlonense* which is grown in Kerala and Ceylon is considered to be true cinnamon while other species of cinnamon known as cassia are considered to be secondary in quality.\(^\text{20}\) In view of the current and prospective demand in the country as well as the export potential when surplus production levels are achieved, cinnamon is of considerable economic importance to the state.

In the case of nutmeg also, Kerala accounts for the largest area under the crop in the country. Though the plant originated in Indonesia it has successfully adapted to the agro-climatic conditions in the Western Ghats. The crop thrives very well in warm humid climate. While a well distributed annual rainfall of 2500mm is ideal for nutmeg it cannot tolerate either excessively dry or water logged conditions.\(^\text{21}\) In the recent years the cultivation of nutmeg became more prevalent in Kerala due to the efforts of the state department of agriculture. It is grown in coconut gardens as a mixed crop. As congenial agro-climatic conditions prevail in the state for the successful cultivations of nutmeg the area under the crop could be further extended.

**Miscellaneous Crops:**

A wide range of medicinal and aromatic plants and herbs are grown in Kerala. However, the potential is only marginally exploited inspite of the congenial ecological and climatic factors.


\(^{21}\) *Nutmeg, Directorate of Cocoa, Areca nut and Spices Development (1979), pp.1-2.*
for the successful growing of these crops. Even those crops which have been raised in the state for several years in the past are getting reduced in area due to various reasons like problems of marketing and relative advantages from growing alternative crops.

Lemongrass (*cymbopogon flexuosus*), citronella grass (*cymbopogon winterianus*), palmarosa oil grass (*cymbopogon martinii*) and vetiver (*vetiveria zizanioides*) are some of the aromatic oil plants successfully adapted to agro-climatic conditions of the state.\(^{22}\)

Medicinal plants like Rauwolfia (*Rauwolfia serpentina*), Belladona (*Atropa belladona*), Senna (*Cassia angustifolia*), Opium poppy (*Papaver somniferum*) and Foxglove (*Digitalis lutea*) would thrive under the soil and climatic conditions of the state.\(^{23}\)

While some of the crops of commercial significance now grown in Kerala have been of exotic origin but were successfully domesticiated, many crops like cardamom, ginger, turmeric, pepper are believed to have originated here. It is pertinent to infer that the process of evolution of the crops of indigenous origin was activated by the congenial agro-climatic conditions of the region. The successful adaptation of exotic tropical crops to the eco-climatic system of the state demonstrates its inherent advantages which helped the process. The specific varieties of

\(^{22}\) *Handbook of Agriculture*, Indian Council of Agriculture Research, New Delhi (1980).

\(^{23}\) Ibid.
ginger, cardamom, pepper, turmeric etc. which have marked export demand due to their intrinsic quality factors, have to be further upgraded to sustain and expand the demand. The monopoly position which the state had enjoyed in the past in respect of these crops is fast getting eroded as the crops are increasingly being cultivated in other states in the country. Cardamom is successfully grown now in Sikkim and West Bengal while ginger cultivation has extended to Meghalaya. Coconut and cashew have spread extensively to many states in the country. In view of these developments, the advantages of the state's eco-climatic system may lose its dominance in the coming years. Hence an appropriate strategy for varietal upgradation and development of high yielding strains of the crops with required quality characteristics would become necessary.