CHAPTER 6
AGROCLIMATIC ZONES

6.1 INTRODUCTION

According to the FAO (1983), an Agroclimatic zone is a land unit in terms of major climate and is climatically suitable for a certain range of crops and cultivations within such a zone. Local conditions may result in several subsystems each with its own climatic conditions. An agroclimatic zone, in fact, has a greater degree of commodity of the relevant basic features of soils, topography, climate and water resources. This fact form the basis for delineating the both agroclimatic regions presented here.

Superimposition of the spatial distribution maps depicting the different parameters has resulted in dividing State into nine agroclimatic zones (Fig 6.1). The nine zones are

1. Northern low land
2. Northern midland
3. Northern highland
4. Central low land
5. Central midland
6. Central highland
7. Southern lowland
KERALA
AGROCLIMATIC ZONES

REFERENCE
NL - NORTHERN LOWLAND
NM - NORTHERN MIDLAND
NH - NORTHERN HIGHLAND
CL - CENTRAL LOWLAND
CM - CENTRAL MIDLAND
CH - CENTRAL HIGHLAND
SL - SOUTHERN LOWLAND
SM - SOUTHERN MIDLAND
SH - SOUTHERN HIGHLAND

FIG. 6.1
8. Southern midland
9. Southern highland

A brief description of each zone is presented here.

Northern low land

This zone consists of the western low land parts of the four northern districts of Kasargod, Cannanore, Kozhicode and Malappuram. This zone receives heavy rain during south west monsoon season and moderate RF during North East Monsoon. However, the during the months of December - May a prolonged dryness prevailed. During this period crops to experience the significant moisture stress. That affects their growth, development of yields. On the other hand, heavy rains during the peak south west monsoon months of June and July also pose a hazard at times due to water logging. In the coastal strip of Malappuram district, known as the kcole lands salinity, acidity and poor drainage are characteristic features. Generally only one paddy crop is possible in the kcole areas. As they are submerged during the other periods. In the entire zone coconut and rice are the principle crops.

Northern mid land

This zone occupies the midland parts of the four northern districts of Kasargod, Cannanore, Kozhicode and Malappuram. As in the previous case this zone is endowed with plentiful rain fall during the monsoon but suffers from dryness for four to five months from December onwards. The midland region however gets more rainfall than the lowland regions. The soil in the zone is mainly lateritic. Rice, coconut, arecanut, pepper are the important crops.
Northern high land

This zone consists of the western parts of Malappuram, major part of Waynad and the extreme south east portions of Cannanore districts. The region receives heavy rain fall from June to September, and moderate rain fall in the pre-monsoon and the post monsoon months. The crops have to face the moisture stress from December to March. The soil type is forest loam characteristics by a surface layer of humus and other organic matter. Coffee is the most widely cultivated crop while pepper, cardamom, ginger and tea are the other plantation crops.

Central low land

This zone consists of the coastal belts of Trichur and Ernakulam districts. This zone is characterised by heavy rain fall during the south west monsoon season and moderate rain fall during the north east monsoon. A dry spell of six months from December to May is generally observed. The coastal strip of Trissur district is an extensive of the Kole area of the contiguous Malappuram district. As was already mentioned, acidity and salinity are characteristic of this region.

The marshy areas of Ernakulam district where salt water intrusion is a major problem are called Pokkali areas. The soils are acidic and saline only one rice crop is raised in these areas and the land is submerged during the monsoon months and frequently disturbed by seawater inundation due to tidal currents. Coconut and rice are the principal crops. In recent times prawn culture is also a prominent occupation.
Central mid land

This zone consists of mid land parts of Palghat, Trichur and Ernakulam districts. The rain fall pattern is similar to the previous zone. Soil type is mainly laterite and rice is the major crop of the region. Coconut and the arecanut are the other important crop.

Central high land

This zone consists of the high land regions of Palakkad and the northern most portions of Idukki districts. In this zone the main rainfall period is the south west monsoon. Forest loam and laterites are the main types of soils.

Southern low land

The coastal low lands of Trivandrum, Quilon, Allepey districts form this zone. In this zone too the south west monsoon is dominant source of rainfall. In addition, north east monsoon is also significant. However, the annual average rain fall is lower than all the zones discussed above. The low lying lands and the backwater systems comprise the Kuttanad area and are interspersed with lakes. Lagoons and marshes. The main feature of this area is the flooding during the monsoon and the periodic seawater intrusion.

Southern mid land

The zone comprises the midland areas of Trivandrum, Quilon, Pathanamthitta, Allepey and Ernakulam. The soils are mainly lateritic and the major crops are rice, coconut, pepper, cashew, rubber and arecanut.
Southern high land

This zone comprises of the high ranges of all the southern districts. Agriculture and animal husbandry are the main occupation of the people here. Very heavy rain fall occurs during south west monsoon period while it is very low between December to March. The highest mean rain fall of 507 cm is observed in Neriamanagalam. Strangely, the lowest rain fall in Kerala (60 cm) is observed at Chinnar, a station 35 km away on the boundary of Idukky district. Mainly two types of soils, forest loam and laterite are observed supporting plantation crops such as Tea, rubber, coconut arecanut and coffee.

6.2 OPTIMUM LANDUSE PATTERN FOR KERALA

After the delineation of agroclimatic zone in the previous section, an optimum landuse pattern for the State is proposed here. In order to arrive at the best possible landuse pattern the various maps of soil, physiography and geomorphology have been superimposed on the map depicting the agroclimatic zones. This overlay technique ensures that all the available physico-climatic parameters are considered in suggesting the most suitable landuse pattern for the State. As our main focus is an agricultural land use areas suitable for agriculture have been demarcated and presented in figure 6.2.

Based on the superimposition of the overlays of climate, vegetation, geomorphology, soil and physiography, a composite map has been derived (general trend of agroclimatic map). It is observed that the northern lowland consists of mixed
SUGGESTED LANDUSE

REFERENCES
R - Rice
C - Coconut
S - Settlement
RP - Rubber Plantation
F - Forest
FP - Forest Plantation
Ctn - Cotton
Ols - Oilseeds
W.LCS - Wetland Conservation
M - Mixed Crop

FIG. 6.2
crop like rice and coconut. In the northern midland region plantation and rubber are the main crop cultivated. In the northern highland region forest, other tree crops and pepper are the important ones found in this area. In the central lowland region rice and mixed crops are found. In the central midland region rubber and coconut are the other major crops. The central highland region is occupied with oil seeds and cotton. In the southern lowland region rice, coconut and mixed crops are found. The southern midland region consists of rubber plantation and mixed crop. The southern highland region consists of mixed tree crops and cardamon plantation. It is also important and necessary that the areas suitable for agricultural landuse are further studied in detail to evolve the optimum crop combination and cropping patterns so that the agricultural potentials of the areas are effectively harnessed. The physioclimatic feature of the areas suitable for agriculture have been examined in relation to the optimum physical requirements of the various crops in the different seasons. Such a procedure helps to suggest the most appropriate cropping patterns over the State, so that sustainable agriculture can be developed. Using this approach, most suitable land use pattern is suggested in the following.

6.3 SUGGESTED LANDUSE PATTERN FOR KERALA STATE

In order to increase the area under cultivation, it is essential to identify the waste lands, distributed throughout Kerala State. For example the hard crust laterite formation that occupy more areas in the eastern part of the Cannanore and Kasargod district of Kerala could be exploited in a rational manner so as to cultivate crops that can withstands some aridity conditions. The laterite formation in the Northern part of
Kerala will be of immense help for the farmers to increase the cultivable area considerably.

Reclamation of the wetlands of Kerala is yet another approach to bring the marginal land under cultivation. Best suitable crops to be cultivated in reclaimed wetlands may be coconut, rubber etc. In some areas, tapioca is grown as pure crop, where some crop may be added as an inter crop in order to achieve maximum use of the land without affecting the environment.

Pulse varieties, such as cowpea, horsegram etc or oil seeds such as sesamum, ground nut etc can be intercropped with tapioca.

Nendran and red banana are high value crops widely grown as a pure crop in dry lands. Some suitable crops that can withstand dry period may be identified and suitable crop may be cultivated.

Identification of suitable intercrops for the partially shredded conditions in coconut gardens may be done in order to optimise the agriculture. Paddy fields remain fallow in many locations after harvest of the second crop of paddy. Short duration pulse varieties suitable for summer rise fallows may be identified.

Drought tolerant high yielding or improved varieties of vegetables suitable for fallow cropping may be attempted.
The interspace between coconut palms, can be utilised for growing pulses and oil seeds in addition to tapioca, banana and cocoa. Suitable shade tolerant varieties of pulses, oil seeds, rice and fodder had to be evolved.

By providing better irrigation facilities, third crop can be cultivated. The high cost of cultivation and comparatively low return on rice now a days had adversely affected both area and productivity of paddy.

Proper utilisation of cashew apple now being wasted, can generate 50% more income to the farmer.

Areca nut production can be improved by adopting proper management practices including irrigation.

It is expected that the above suggestions for the optimum landuse pattern suggested after an in depth study of all the important physiographic and agroclimatic features would be a positive step forward in developing the agricultural economy of the State.