Chapter II

ORGANIZATION

Introduction:

The location and boundaries, historical background, physiography, geology, drainage, climate, soil types and the natural vegetations of the study region was studied.

Location and Boundaries of the Study Region:

The Maharashtra State is administratively divided into six divisions, viz. Konkan, Nasik, Pune, Amravati, Nagpur and Aurangabad. The Aurangabad division, known also as Marathwada was formerly a part of Hyderabad state. Marathwada forms the central portion of Maharashtra with Aurangabad city being located almost in the centre of the state. In Aurangabad city there is confluence of North and South. Marathwada is one of the most backward regions of Maharashtra state.

The Marathwada region lies in the upper Godavari basin, which extends from 17°35' North latitude to 20°40' North latitude and from 74°40' East longitude to 78°19' east longitude. The study region is bounded on the north by Jalgaon, Buldhana and Akola districts, to the north east by Yavatmal district to the east by Kamareddi, Nizamabad and Adilabad districts of Andhra Pradesh to the south and south east by Bidar and Gulbarga districts of Karnataka state to the west by Ahmednagar to the southwest by Solapur and to the North West by Nasik district. Its shape is roughly triangular. East-West maximum extent is about 394 Kilometers and North-South extent is about 330 Kilometers. It has a total area 64,302 sq. km., which is 21.01 percent of the state and its population is 1.28 crores which is 16.22% of the state (1991).

Administratively area is divided into seven districts that are further subdivided into 59 tahsils. Before 1992 there were 46 tahsils in Marathwada but now 13 tahsils are newly declared five in Parbhani district and two each in Jalna, Latur, Nanded and Beed district.
LOCATION OF THE REGION

MAHARASHTRA

MARATHWADA

AURANGABAD

JALNA

PARBHANI

BEED

NANDED

OSMANABAD

INDIA
**Historical Background of the Study Region:**

The name ‘Marathwada’ indicates ‘House of Maratha People’ i.e. a land occupied by Marathi speaking people in the former state of Hyderabad. The origin of the term may be traced back to the 18th century as noticed in the state records of the Nizam of Hyderabad. The form of government in Hyderabad State was a compromise between autocracy and oligarchy. The oligarchy was represented by a member of powerful Jagirdars who symbolized the feudal nature of economy. The basic policy of the Nizam from generation to generation had to present the economic integration.

The system of creating Jagirs was started by the Nizam I and was perpetuated by his successors. The majority of the Jagirdars possessed sovereign rights in their own Jagir and had independent civil and criminal powers. In short Jagirdars under the Nizam regime neglected the welfare of the people and thirty percent of the population of Marathwada became victims of feudal exploitation.

In September, 1948 the erstwhile Nizam state, as also Marathwada became free and was amalgamated with the Indian union, but remained as Hyderabad state, an administrative entity. The position of Marathwada in the new administrative set up improved and the five directorates were contributed as sub-administrative unit with Auranagabad as its headquarter. The entire unit remained in Hyderabad state till the state reorganization (i.e. November, 1956) and was adjusted to the bi-lingral Bombay state and Later on to the present Maharashtra State. This region is a land of saints, nursery of culture and seat of empires in a way goes to epitomize the course of Indian History. The achievements of this region’s in the field of art, culture, learning and spiritual life are very great. The world renowned caves of Ajanta and Ellora are still with us to speak of ancient glory that India was what human agencies could envision and execute.
Marathwada is called ‘Problem region’ on the basis of population resources, relationship and their capacity to support non-agricultural population, suffers from the problem of less planned utilization of resources due to certain environment, poorly developed transport system and dearth of skilled workers.

**Physiography of the Study Region:**

Physiography is one of the dominant parameter of physical environment and its impact on patterns and density of agriculture is immense. The study of the influence of environment upon the nature and distribution of crops and livestock is of prime importance in agriculture geography. Nature with its physical characteristics provided a host of possibilities for agriculture in different areas.

Marathwada is a part of deccan plateau with general slope in south-east direction from Sahyadris and has many features in common with upland districts of deccan plateau. It shows a combination of small and big plateaus, hilly ranges, Measas, buttes and inselbergs and presents generally highly dissected landscape. As a part of the deccan plateau, the land of the Marathwada region has a general elevation of about 500 meters above the sea level, highest and lowest level being 958 in the Satmala rang and 366 meters above sea level on the Godavari bank near the point where the river crosses over the Parbhani district boundary. Marathwada is divided into two broad physical divisions.

Hilly ranges

River basins.
Hilly Ranges:

There are two major hilly ranges in the region, the Satmala in the north and Balaghat in the south. (A) The Satmala of the Ajanta range enters at the north-western corner of the region and runs close and parallel to the northern border of the region upto Ajanta acting as the watershed between the Tapi valley in the north and Godavary valley in south. The Satmala hill (943 meters) from which one of the names of the range is derived is situated north of the Kannad town. The outranghat providing road communication from Kannad to Chatisgaon across the Satmala range is situated about 7 km. to the west of this Satmala range. The Satmala range contains several hill forts on it overlooking the Tapi valley to the north from west to east they are Antur (826 Meters), Satonba (552 Meters), Abasgadh (671 Meters), Baithalwadi (625 Meters) and Ajanta (578 Meters).

Nearly the tri-function formed by Nasik, Jalgaon and Aurangabad districts a branch of Ajanta range first extends southwards and then proceeds nearly eastwards as far the Shivana Nadi. This contains several peaks over 760 metres and three of them rise over 900 meters. The first two of the latter are situated in close proximity to each other in the west where, this ridge changes from southerly to easterly direction and the third one the highest (958 Meters) is Surpalnath hill situated further east.
Satmala hill further extends into the Parbhani district and forms a plateau in the northern part of Parbhani district. The Satmala range also enters in the Nanded district; particularly it is located at the northern portion of Nanded district another branch of Satmala, known as the Jalna range, runs through the centers of the Jalna district.

**Baloghat range:**

The Balaghat ranges run through the southern part of the Beed district acting as the watershed between the Godavari basin in the north and Bhima basin is the south. The Balaghat range run for a distance of 350 kms in a north-west and south-east direction right across the region from Ashti in Beed district in the west to Biloli tahsil of Nanded district in the east.

It has an average width of about 8 km and has steep slopes facing north wards the Godavari river. The southern founding scarp of this range starts from Chincholi (Beed district) apex and runs first southwards and then in a south-easterly direction forming boundary between Ashti and Patoda tahasils of Beed district. It enters in Osmanabad district near Langerwadi and runs south-eastwards passing through Udgir tahsil. The railway line as also the road from Parli through Udgir to Bidar of Mysore state run on this ridge. Two significant heights on this are Janwal and Wadwal both about 733 meters. This divide is generally higher in the north-east but decreases in height to the south-east, where it is just above 625 meters. From this there is a low spur branding off near Chakur first running northwards upto a point about 2 kilometers south of Sirur Tajband. From here it runs first eastwards and then north-eastwards passing at of the Osmanabad district beyond Wanjarwada at a height of 500 meters the ridge, on which runs the broad from Latur to Nanded, forms the water divide between Manar and Tiru rivers.

**Minor ranges:**

Besides Satmala and Balaghat ranges running east-west in the region, there are another three important ranges, viz. Jintur range, Mahur hills and Nirmal range. The Jintur range is the more prominent portion in the heights of the Parbhani district. It is a remnant with a general trend from north-west to
south-east and forms a part of the Ajanta range. Mahur hills are found in Parbhani and Nanded districts. Mahur hills are low ranges of hills generally trending west-east separates the Penganga valley from that of the Kaidhu to its south.

To the south of the Satmala ranges the Nirmal ranges running parallel to them and east of the Penganga, they are linked to the formed by off shoot hills which aligned more or less parallel to the course of the river and on which the Nanded boundary runs. These hilly ranges are not useful for agriculture due rugged topography.

**River Basins :**

There are three important river basins in Marathwada region viz. Godavari basin, Marathwada Purna and Penganga basin. The Godavari river basin occupies the southern part of Aurangabad – Jalna districts, Northern part of Beed District and central part of Parbhani and Nanded district. The Purna basin comprises the whole tahsil of Sillod (Aurangabad district), Jafferabad tahsil (Jalna), northern part of Kannad tahsil and eastern part of Khultabad tahsil (Aurangabad District) and Bhokardan tahsil (Jalna district) excluding its small north-eastern portion forming a salient features between Jalgaon and Buldhana districts.

The Penganga, after collecting the waters of the southern belts of the Buldhana and Akola districts drains the north-eastern Margin with the aid of its tributary the Kaidhu river.

Agricultural activities are mainly concentrated in the river basin in the Marathwada region. They are also found over the plateau region.

**Geology :**

No systematic geological work has been carried out in the Marathwada region. The information available on the geology of the region is meager. The underlying rock formation is termed as ‘Deccantraps’ in all the districts and in addition in Aurangabad district it is ‘Arechean Dharwar’ and in Osmanabad it is ‘Pleistocene Recent’. A large part of the region is occupied by rocks similar
to the Deccan trap formation, represented by almost horizontal lava flows of basaltic composition, thought to have been emplaced from fissures towards the close of the Mesozoic era on the lower tertiary era.
These are referred to as Deccan traps owing to their prevalent occurrence in the Deccan and the step like appearance of their exposures. The geological formation met within the region are as follows -

**Recent**: Soil and gravel.

**Cretaceous to Eocene**: Deccan trap flows with intertrapper beds.

**Archean**: Peninsular granite complex the rocks of the Dharwar system are found in Nanded, Parbhani, Jalna, Aurangabad, Beed, Latur and Osmanabad districts. The typical exposures of epidiorites are seen 1.6 kms. South of hill along Tarora Pangri cart tract in Nanded district the Deccan trap flows are spread over an area of about 5 lakh sq. kms. covering part of Maharashtra, Gujarat, Madhya Pradesh, Andhra Pradesh and Karnataka. These flows have been divided into the following three divisions.

- **Upper Trap**: 450 Meters thick near Bombay as in Saurashtra with numerous intertappean beds and largers of volcanic ash.

- **Middle trap 1200 meters**: Madhya Pradesh and Maharashtra with numerous ash beds in upper portion and practically devoid of intertrappeans.

- **Lower Traps**: 150 meters thick Madhya Pradesh and eastern areas with intertrappean beds but are ash beds.

The Marathwada region is occupied by the middle trap. The traps form the main rock formation and their thickness falls eastwards. Along the extreme eastern margins of Nanded district, archean genisses and granites outcrop, breaking the horizontal monotony of the area further west.

**The traps give rise to either brown to red or to black cotton soil (Regur) such belt of soil is noticed around Parbhani, Basmath, Gangakhed, Pathri, Jintur, Aurangabad, Gangapur, Hingoli, Jalna, Ambad, Jafferabad and Manjlgaon etc. tahsil of Marathwada region.**

**Drainage**:
Drainage is a comprehensive expression in geography. It includes surface as well as underground water flow. It is the result of combination of numerous factors including climate particularly precipitation, insulation, humidity, cloudiness, windfore and direction, structure and type of rocks, vegetation, soil and human utilization, human obstructions to natural water flow such as roads, railways, dams and reservoirs also change its nature. However, drainage is one of the most important component of physical environment which affects agriculture directly and indirectly. Groundwater influent becomes the base flow that maintains the flow of streams in fair weather when we speak of surface water we mean stream flow regardless of its source. Therefore, surface water is by far the most important means for providing substantial irrigation with stabilizes and improves agro-economic life in an area that has otherwise plenty of land potential. Because of the uncertainty in the flow of surface water it is probable that any attempt to improve agricultural techniques and land-use planning without combating the problem with the help of shallow and deep water tables is bound to be absorptive.

Generally rivers of the Marathwada region are from north-west to south-east direction. The drainage of the area is of the ordinary denratic pattern because rivers have developed a branch like system. Most of the rivers are seasonal except Godavari Marathwada Purna, Manjara and Penganga. The rivers of the Marathwada region are useful for the agricultural development of the region. In monsoon season most of the rivers are having huge water in their beds.

The following are the notable rivers in Marathwada region.

i. **Godavari**

Godavari is the most important river in this region. Godavari enters in Marathwada region of Punfamba in the Aurangabad district, runs on its southern boundary separating it from the Beed district, flow through the Parbhani and Nanded districts to enter the Andhra Pradesh. Purna enters the region from the north-west corner of the Parbhani district and flows south-east to fall into Godavari about 24 kilometers cupstream from Nanded district. From the eight bank it receives the Sindhaphana (which drains the land of
Beed district) and the wan, the Macchili, the Galati and the Dhond streams. Agricultural activities are highly concentrated in Godavari river basin.

ii. **Marathwada Purna**:

The Marathwada Purna takes its rise in the Ajanta range about 56.31 kms to the north of Aurangabad city in Ajanta hills in the Kannad tahsil of Aurangabad district.
It has a general south-westerly trend for the major length, but in the last stretch of about 72.4 Kilometers, it flows almost due south to reach Godavari. The river has a length of about 273.53 kilometers which lies in Buldhana district the Purna drains the land of Aurangabad and Parbhani districts of Marathwada region. In the region of the source waters, which lies in Aurangabad Khelna, Anjan and Girna but in the lower middle portion, which lies in Parbhani district has entrenched and meandering course flanked by enclosed scarp-lands on either side.

iii. **Dudhana**:

The Dudhana a major tributary of the Purna, take its rise in Aurangabad district in the wide amphitheatre of the Khultabad Mahismal range, which also is the source region of the Kham river in Aurangabad district. After draining the hilly region through small tributaries, the river acquires a broad and more perennial from about 56.32 kilometers down stream. For the first 96.54 kilometers it drains the land of Aurangabad and Jalna districts. In Parbhani it has another stretch of about 80.45 kms. before it joins the Purna a little to the north-east of Parbhani city.

**Manjara River**:

The Manjara rising near Dharmapuri in Beed district. The Manjara sometimes called the Wanjara river. Many streams viz. Chausala, the Limba, the Waghi, the Yelmachi, the Kaij, the Chandanmeets to the Manjara river in the Beed district. The Manjara river enters Nanded district in a south-westerly direction 3 kilometers south of Malegaon and after passing to south of Kandhar (Nanded Districts) turns and flows in a south-easterly direction to join the Godavari.

The other important rivers are Lendi, Bendsura, Dhondrai, Sidhapana, Saraswati in Beed District, Penganga, Manyad, Ashna, Lendi in Nanded district, Kaydhu, Kapra in Parbhani district and Kham in Aurangabad district. Most of the rivers of Marathwada region have seasonal flow. They become dry in the summer season; hence they are not useful for agriculture in the summer season. Therefore, it is necessary to put the various bandhara’s in
these rivers and store the wastage water in rainy season and use that water for irrigation in winter and summer season.

**Climate:**

In a large measure climate determines where man may live and thrive, what crops, he may raise? What type of home he may appropriately build? What sort of clothing he may wear? And what pests and diseases he must combat? The potential crop producing capability of a given area is dependent mainly on the existing climate and soil conditions. Since, Climatic factors exerts mainly a regional influence on plan life, the differences in the behavior on a crop or a group or a group of crops over extensive area as in a given state or a group of states, may be considered as due primarily of differences in climatic rather than soil conditions. It is obvious that climate dictates the range of crops which a country can economically produce. This in turn sets the range of commodities which that country must import if it wishes its people to live a full life in the modern sense. The success or failure of the cropping season is determined by the intensity of the climatic factors. The three most important factors of climate from the stand point of plant response are temperature, water supply and light they may be treated as primary determinants of crop growth.

Climate plays an important role in affecting the characteristics of agricultural economy in a region. It can influence the choice of farming system either indirectly through its impact on soil formation or directly through such as the length of the growing seasons, the occurrence of frost and the availability of water for crop growth.

The climate of the Marathwada region is generally dry except the during the south-west monsoon. The year may be divided into four seasons. The cold season from December to February followed by the hot season from March to May, the south-west monsoon from June to September and the post monsoon season from October to November.
Temperature conditions have been for less erratic from year to year than rainfall conditions in each agricultural region. However, great annual ranges may be highly significant in different zones giving rise two or more cropping seasons. For this reason, especially in Marathwada different crops are raised in different seasons.

Without suitable temperature conditions, germination of seeds and growth of plants are retarded. Temperature regulates all the chemical and physical processes of plant metabolism. The metabolic processes begin at a certain minimum temperature and increase with rise of temperature until they reach a maximum at a temperature called the optimum. Further with rise in temperature above the optimum level the metabolic activity is slowed down until it ceases at a temperature called the maximum. Each species has its own minimum and maximum beyond which its life activity ceases.

Each crop plant needs a certain number of effective heat units for germination, growth, stalking, maturing and ripening. This is called the thermal constant and varies from crop to crop. Temperature above the minimum is therefore, effective in furthering the growth of a plant forwards maturity and ripening. The crucial air temperature is 6°C (Schimper 1903) at and above which plants grow. It is also known as the crucial limit. Ideal temperature conditions for crop production are between 18.3°C and 23.9°C.

For the agricultural geography, two of the best indicators of regional differences in temperature currently available or derived are (i) length of the growing season and (ii) accumulated temperature above the maximum for plant growth. The meteorological observatory is found in the Marathwada region at Aurangabad, Chikalthana, Parbhani, Beed, Nanded and Osmanabad. The temperature and the other meteorological data at these stations may be taken as representative of the conditions over the region as a whole. The cold weather commences towards the end of November when the temperatures beings to fall. December is the coldest month in all districts of the Marathwada region.
In the cold season the region is sometimes affected by cold waves which are associated with the passage eastwards of western disturbances across North India on such occasions, the minimum temperature may drop to \(5^0\) or \(6^0\) Celsius. The period from March to May is one of continuous increase in both day and night temperatures. Sometimes day temperatures increases upto \(45^0\) Celsius in Parbhani, Beed, Latur and also Aurangabad district. With the advance of the south-west monsoon into the region by about the first or second week of June temperatures fall appreciably and the weather is pleasant throughout the south-west monsoon by about the first week of October the monsoon winds stops and the temperatures show a slight increase in October. Therefore temperature begins to drop gradually.

**Rainfall:**

Rainfall as the primary ecological parameter has created a variety of farming enterprises, types or systems in the world. It is the dominant single weather element influencing the intensity and location of farming systems and the farmer’s choice of enterprises. It also becomes a climatic hazard to farming when it is characterized with scantiness, concentration, intensity, variability and unreliability. It is all the more important in the minimal regions, where average or normal rain fall is generally necessary for successful crop production. In such area the system of crop production must be correlated more or less to the moisture factor. About more than 84% of the annual rainfall in the region is received during the south-west monsoon season, the rainiest month being July, July gets the heaviest rainfall in the north east, while the retreating monsoon rainfall in September becomes more important in the east an average there are 45 rainy days.

The south-west monsoon is the pivot around which almost the entire farm life and economy swings. Rainfall has control and for this reason is a seasonal rhythm of conditions influencing the patterns of landuse.

The record of the rainfall in the Marathwada region is available for the period ranging from 1970 to 1995. The details of the mean annual rainfall and co-efficient of rainfall variability from 1970 to 1995 are given below.
Table : 2.1

Mean Annual rainfall, and Co-efficient of Rainfall Variability

<table>
<thead>
<tr>
<th>Name of the District</th>
<th>Mean annual rainfall in mm</th>
<th>Co-efficient of rainfall variability in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aurangabad</td>
<td>719</td>
<td>32</td>
</tr>
<tr>
<td>Jalna</td>
<td>909</td>
<td>36.77</td>
</tr>
<tr>
<td>Beed</td>
<td>722</td>
<td>38.45</td>
</tr>
<tr>
<td>Parbhani</td>
<td>932</td>
<td>30.68</td>
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<tr>
<td>Nanded</td>
<td>979</td>
<td>36.56</td>
</tr>
<tr>
<td>Latur</td>
<td>799</td>
<td>29.96</td>
</tr>
<tr>
<td>Osmanabad</td>
<td>810</td>
<td>33.51</td>
</tr>
</tbody>
</table>

Source : Computed by the Author.
MARATHWADA REGION

DISTRICTWISE DISTRIBUTION
OF RAINFALL

INDEX

- ABOVE 900 M.M.
- 800 TO 900 M.M.
- BELOW 800 M.M.

KM 25 12.5 0 25 KM
The main annual rainfall in the region varies from 719 mm. in Aurangabad district to 979 mm in Nanded district. Generally rainfall decreases from east to west and south to north in the study region.