Chapter II

Personality of the Region

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Chapter II

Personality of the Region

2.1 Introduction

In the previous chapter Introduction Human Settlement System, Definition and scope, aims and objectives and approaches database and methodology, pattern of studies, types of rural settlement, study area, rural settlement dispersion chapter scheme and review of literature are discussed in detail. This chapter is mainly related with location and boundaries. Historical background, Physiographic, drainage, climate, Geology administrative evaluation soil and vegetation. These physical factors of the Akola district are discussed from the view point of settlement development.

2.2 Location and Boundaries:

The district of Akola Lies in the Western parts of the Nagpur division of Maharashtra state and is surrounded by Amravati district in the North and North- East Yawatmal in the South- East, Buldhana in the West and Hingoli in the South. the old district lies between 19° 51' and 21° 16 North latitudes and 76° 38 East longitudes and 77° 44' East Longitudes. It has a total area of 10567 square Km. (Map.2.1)

2.3 Administrative evolution:

Starting from the junction of Buldhana, Amravati and Akola Districts the boundary runs Eastwards along the foot hill of the Sapuda scrap at elevation of 400 meter till reading the celebrated triple hill fort of Narnala, Jafribad and teliaghat situated romantically at a height of Narnala, Jafribad and teliaghat situated romantically at a height of 1000 meter over a flat plateau overlooking the penghat plains.
Before 1982 there were Akola, Akot, Murtijapur, Magrulpur, Balapur and Washim Tahsils in the Akola district. After 1982 all six Tahsils divided and 13 new tahsils came into existence i.e. Akola, Barshitakli, Akot, Telhara, Murtijapur, Karanja, Magrulpur, Manora, Washim, Malegaon, Risod, Balapur and Patur. In 1991 there were 10 Municipality, 13 Panchayat Samitees. About 1574 villages were having human settlement. From 1st July 1998 Akola district was divided into Akola and Washim district. Newly formed Washim district cover Tahsil like Washim, Karanja, Magrulpur, Manora, Risod and Malegaon tahsil. But another has taken old district of Akola for the study done to non-availability of time services data. It means old 13 Tahsils are selected for the study for the period of 1981-82 to 2004-05.

2.4 Historical Background:

In the ancient period Akola district was part of Dandkaryana, where some shrms were for being the centers of education. Long ago the place where is situated the prefect town of Akola was a thick forest. In the mist of the forest there was a temple of Shiva. At some time distance from lived a person named Akolasinh in the village of Kothri. His wife being a devout worshipper of Shiva used to visit the temple daily Having doubts regarding the fidelity of his wife one day Akolasinh followed his wife with a sword in his hand. When just near the temple the wife of Akolsinh Saw Akolasinh with a sword in his hand and she immediately came to know the suspicion that god engulfed the mind of her husband. She realized the danger that overhand her and she prayed to the god give her an eternal place of rogue. The shivlinga, spontaneously opened into two parts and she disappeared with in it. The frantic efforts by Akolasinha to search his wife proved futile and what he could away lay his hands upon was a thread of the sari used by his wife which for years protruded from the head of
the image. The town a small village then is aid to have been established by Akolasinh.

Mention of Akola is available in historical records till 1658 when Aurangzeb ascended the throne of Delhi. The town of Akola was conferred upon Asadkhan when he become the Primminster, when the town was bestowed upon Asadkhan. It was a small village while Balapur was a rich town being the centre of political activities then and Akola was known at that time as Akola Balapur.

No exploration or archaeological excavation has yet been under taken in this district we have no definite information about its pre historic and protohistoric periods. But this districts forms a part of vidharbha and excavations have recently been done at Kundinpur in the adjoining district of Amaravati and also at Pavnar in Wardha. Akola district like other parts of Vidarbha was undoubtedly included in the empire of Ashoka.

In 1853, Bearer which formed a part of the Nizam dominion was a signed to the east India company in liquidation of the large debt due on account of arrears of pay of the Hyderabad contingent and as a security for future payment of the forces.

At that time Berea was divided into two districts south bearer with head quarters at Hingoli and north bearer with headquarters at Buldana. After 1857 Hingoli its neighboring area was restored to the Nizam and Barear was reconstituted into two districts. East Barer with headquarters at Akola in 1903 the treaties of assignment were superseded by an agreement under which the Nizam leased Bearer to the Government of India in perpetuity. Administration of bearer was transferred from Hyderabad to the Chief commissioner of central provinces. Some areas was also transferred in 1875 to the newly created Basin
(Washim) district Mangrol taluka was newly created in that district in the same year.

At the time of 1961 census the district comprised of 6 tahsils which in themselves included 1507 inhabited villages and nine towns. At the time of 1971 census the district has 6 tahsils comprising 1708 villages (including 219 uninhabited) and 9 towns. Since 1961 number of tahsils and town in the district remained unchanged till reference date of 1st March 1981. However there have been certain changes as to the number of villages with in tahsils during the decade 1971 - 81 with the upgrading of hamlet in the district, the number of villages has gone up to 1343 (including 197 uninhibited villages). At the time of 1991 census the district has 13 tahsils comprising 1547 villages (including 202 uninhabited) and ten town. After 1981 census 7 new tahsils have been formed from the existing 6 tahsils.

Tahsils divided and 13 new Tahsils came into existence i.e. Akola, Barshitakli, Akot, Telhara, Murtijapur, Karanja, Magrulpir, Manora, Washim, Malegaon, Risod, Balapur and Patur. In 1991 there were 10 municipality, 13 Panchayat Samitees. About 1574 villages were having human settlement. From 1st July 1998 Akola district was divided into Akola and Washim District. Newly Formed Washim district cover Tahsil like Washim, Karanja, Magrulpir, Manora, Risod and Malegaon Tahsil. But another has taken old district of Akola for the study done to non availability of time services data. It means old 13 Tahsils are selected for the study for the period of 1981-82 to 2004-05

2.5 Physiography:

Physiographic is the important factor which plays an important role in the development of agriculture any region. Physiographic is one of the dominant parameter of physical Environment and its impact on patterns and density of agriculture is immense². The study of the influence of environment
upon the nature and the distribution of crops and livestock in of prime importance in agricultural geography. Nature with its physical characteristics provides a host of possibilities for agriculture and agro based industries in different areas.

In relief, the district shares a similarity of Topographical arrangements as found in Buldhana district. It also falls into these physical units, a narrow Northern strip in the Akola Tahashil in the Satpuda foot hills, the Penghat or Purna plains in the middle, occupying nearly half the district area in the Tahashil of Akot, Balapur, Akola, Barshitakli, Telhara and Murtijapur and the Balaghat on the top of the Ajanta ranges comprising Washim Karanja, Mangrulpur, Manora, Risod Tahashil to the South. (Map No. 2.2)

The landscape in the district though not highly hilly, still offers interesting contrasts between the platue and the plains, further enriched by a forested ghat country and a bad land topography joining the Mun river.

**Hills**: The district does not have any large area under extensive hill ranges. The Northern extreme of the district in the foot hills of Satpuda and the ghat country, through which the land rives from the Purna plains to Balaghat plateau as well as the isolated broken hill terrain in the extreme. South East in Magrulpir Tahashil are the only regions of relatively higher elevation.

**Melghat**: The Melghat referred as the Satpuda scrape in vidharbha region of Maharashtra state forms a newly small part within the district. In fact, it is only the extreme Southern foot hill slopes at an average elevation of about 400 meter that are found within the district forming a linear strip of average width of 2 to 5 Km. This plateau at an elevation of 940 meters has the celebrated uninhabited Narmala fort on its top overlooking the Penghat plains. The accent to this fort from the plains below is a through a super of hills and ridges through inter mediatory flat structural levels. This foot hill region everywhere is scoured by hill torrents and gullies that have in many place developed extensive describe slope.
Physiographic Map in Akola District

Map 2.2
Ajanta Range: The Ajanta range carrying on its flat top the Buldhana plateau of Washim and Magrulpir Tahsil has steep rims facing North and descending to the Purna plains. This hilly ghat country at an overall elevation of about 400 meter is extremely uneven and range with a tangle of will masses covered by Jungles. It has a curving trend from West to East. It is highly dissected carrying everywhere small un dissected section of plateau forming isolated stanches of mesa separated by deep river valleys in which the river have serpentine courses. This scarps edge is comparatively, more well defined in the Southern parts of Balapur mid Akola Tahshils.

Another area of hill terrain within the district is seen in the Southern part of the Mangrulpir Tahasil particularly, along the boundaries of Yawatmal district. This tangle of the hill masses rising to an elevation of 500 to 600 meter is much less dissected than the Northern scrap slope at a comparatively lower elevation.

This slope in many place is cut into by the tributaries of the Penganga forming deep entrenched valleys that constitute the main lines of the access and habitation development.

Plateau: The Washim and Magrulpir Plateau in the Balghat are at an elevation of 400 to 500 meter sloping gently to the East. The plain an average 50 kilometer wide. It is bounded in the North by the Melghat and in the South by the Ajanta Scrap and it is believed by the geologists to be the green floor developed as a result of faulting during the recent geological past. It is alluvial, in filled the alluvial have been brought and deposited by the Purna and its tributaries. The alluvium in the most of the place contains calcareous Kankar nodules and is fossil ferrous. The thickness of alluvium in most of the places exceeds 400 meters. Physiographic of Akola district is favorable for the development of Agricultural except Ajanta range and same hilly terrain.
2.6 Geology:

Geological structures have both indirect and direct influences on land use. The indirect influences may be categorized into.

a) Ground having presence of the absence of any geological occurrences.

b) Formation of soil from the parent source region.

c) Influences of permanent water table and

d) Surface water supply and underground drainage.

Land utilization of any region is the direct product of its geological structure and main is the source behind molding land use. According to their need and the geological ingredients of the region \(^3\) In mountainous region the formation of soils by the cracking of rocks is an important process of soil formation. In such areas owing to the presence of boulders and river of rocks, the soil is primarily not suitable for use. The texture of drainage and availability of underground water are the products of their geological conditions.

Akola district is bounded on the North by the Southern foot hill of the Gavligarh range which, in town form a part of the Satpuda range of hills on South, it is bounded by the Ajanta and Satmala hills. Another range comprising of steep hills runs across the middle of the Southern Tahasils, but for the above abruptly rising hills, the entire district is more or less alluvial tract drained by the Purna, Ktepurna, Adan and Penganga river. The entire district remains geologically unmapped but for the inspection of a few particulars sites carried out by the offices of the geological survey of India for studies on ground water problems and suitability of dam sites. A brief reference to the geology of the district is made by Balanford (1969) in his Publication “ON the geology of the Taptee and Narbada Villages and some adjoining district \(^4\) Wherein the silent factors of the Southern parts of the Gawaiagarh range and the Purna plain are
outlined. But for a small patch of the upper Gondwana Sandstone reported by Vaidyanath (1961) the entire district is occupied by Deccan Basalt flows with intertrappean beds at places river alluvia and soils.

2.7 Drainage:

The success of vertical drainage depends upon the presence of favorable aquifer and water table for lifting the ground water on a sustained basis and the favorable quality of water that could be reutilized for irrigation purposes. From the hydrological point of view the point of the view of the Purna valley falling in the district could be divided in two categories. (I) The fresh water tract - this tract occupies the Northern part of the district close to the Gavligarh range covered by the boulders and debris. Here abundant supplies of fresh water are available at a depth of 3 to 5 meters from the surface. (II) Saline Tract - the salinity map of the area reveals that the chloride content increase in general towards the Purna river from either edge of the Purna Valley. Drainage texture is expressed as the total length of streams per unit area while its reciprocal is the distance between two adjacent channels. These are the two important parameters by which one can estimate soil erosion. (Map 2.3)

Surface drainage is the disposal of excess rain water over ground surface through an open drainage system with an adequate outlet. Surface drainage is helpful where (I) Soils are deep with low infiltration rates where (II) intensity of rainfall is high where (III) terrain is level to nearly level and where (IV) the water table is high.

Any bore or well from which underlying water is extracted either under pressure or through mechanical lifts can be defined as vertical drainage.
Drainage Map in Akola District

Map 2.3
Surface water that is the water on the surface of Land, represents the drainage from the Land and a part of the rainfall that is absorbed by the soil also becomes surface water by its discharge when it seeps into hills and runnels. The portion of rain or snow that penetrates deeply becomes. The ground water recharge and it is discharged into the streams slowly.

The surface water is by far the most important means for providing substantial irrigation which stabilizes and improves agro climatic 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 table is found to be abortive. 7

However drainage is one of the Most important component of physical environment of which affects agriculture directly and indirectly 8.

The Purna and the Penganga rivers are the two important rivers. The katapurna, shahanur, Morna, Mun, Nand, Man and Uma, which are the tributaries of the Purna and the Adan. the Arna and the pus which are the tributaries of the Penganga.

A) Purna:

The only perennials stream of the Penghat plain the Purna rises in the South facing scarps of Gavligad hills in the district of Aravati. It flows Westwards through the district, forming the Northern boundary of Murtijapur, Akola and Balapur tahasils and the Southern boundary of Akot Tahsil. Though perennial the river is the not navigable. Its channel in many places in 30 meter deep and 200 meters wide. The banks are of sort alluvium. A large number of streams rising in the scarp to its North and to its South Join the river and drain the region with a fairly densest work.
Most of these tributaries are pools of water during hot weather developing swirling floods during rains. The river has a length of about 100 km. in the district. The immediate banks of the Purna river are badly broken and dissected by a strong hill erosion and undercutting of Banks.

The right bank in general is at a higher level than the left bank which seems to be the main reason for a large number of rural settlements being found on its Northern banks. The aggraded valley of Purna has many streams developing a sub parallel drainage to the Main river before their confluence with the main river. Of these tributaries, the Katepurna is the most significant. (Map No. 2.4)

**Tributaries of Purna**

I) **Katepurna**

The Katepurna, rises in the Northern slopes of the Ajanta ranges about 20 km. East of Barshitakli an elevation of 320 meters. It mainly flows North in a non perennial channel. It joins the main river on the left bank of the village batori. It has an overall length of 100 km. in the district. The river in its lower course turns by sharp bends West wards and North wards. Its immediate banks are mostly liable to flooding.

II) **Uma**

The Uma rises in the extreme Southern parts of Murtijapur Tahsil near the village poho and flows to the North. The river almost from the source is perennial. It has fairly straight course braided in the section and crossed at many point by fords. Its joins the Purna near the village Durgaved about 100 k.m. up streams of the Katepurna confluence after.
Tributaries of Purna

Map 2.4
Flowing sub-parallel to the main river on its left bank for about 10 k.m. The river has low banks throughout and a narrow channel and is liable to flooding during the rains. The river flowing entirely within the district, has an overall length of 60 Km. Unlike the other tributaries of the Purna. This river is perennial flowing through a generally better watered region.

III) Pedhi :

The Pedhi rising in the Melghats of the Amrawati district initially flows South West wards and then flows West wards to join the Purna on its left bank near the village Kolsar. This river too is perennial in its lower course and it has quillied banks like the main, river. The river has an overall length of 12 km within the district.

IV) Morna :

The Morna river rises in the Washim Tahsil near Shirpur village and flows through and open and flat country of the plateau, before passing through the large village of Medsi on the edge of the plateau. From here the river goes through the ghats in a romantically picturesque country with Sharpe bends between interlocking spurs developing a deep valley with a cliff face on the other bank and wide alluvial flats on the inner bank before entering into the Penghat plains. In this section the Purna-Akola-Khandwa-railway line closely follows the reverend sticks to the narrow large adjoining the valley side and crosses the river or less than four different places to gain a foothold from one side of the deep valley to the other.

Descending down from the scarp, the river flows through a fairly gently slopping country with a perennial channel on its bed. It skirts past the down of Akola Just after it is joined on its right bank by the tributary, Indrupa. In its Lower course the river has developed extensive meanders and cut off loops,
unlike many other left bank tributaries of the Purna. It developed a sub-parallel course for nearly 20 km village Andura. The length of river 113 km.

V) Mun :

The Mun river rises in the Northern Ajanta scarps of the Chikhali Tahsil of Buldhana district and flows East ward through the Ghatbori resented forest area to enter the district of Akola. Mun makes excellent meanders and of ox-flow lakes is wide plains its immediate are highly quelled. Its tributary Uttavli, and Vishwamitri meets to mun in the region. Particularly it flows though Balapur Tahsil. Mun joins the Purna river near the village of Khajikhed on its left bank. It forms for quite some distance the boundary between Buldhana and Akola districts.

The right bank tributaries going the Purna from the North are comparatively smaller hill torrents draining the foot hill slopes of the Melghat of these the Nagzari. The Gautami, Widruba and the Shahanur river are the most important tributaries. The left bank tributaries are more important than the right bank ones and the main river itself flows closer to the Northern scarp slopes than the Southern one.

B) Penganga :

The Penganga river rises in the Deulghat hills of the Buldhana plateau and flows East to enter Akola district in its South Western parts in Washim Tahsil near the village wakad. The river has an overall length of 100 km in its course through the district. Initially, it flows through a rolling plateau country in a narrow Chanel less than 100 meter wide with sharp bends. It forms the boundary between the district and Parbhani from the village Warud Topa down stream till its exit into the Yawatmal district. In this section, where it forms the boundary, the river, bed is wider and rugged and the river channel itself is braided. The river turns at sharp bends, suggestive of the joint control
of the bed rocks. In its entire course through the district, the river is non perennial. It has many tributaries within the district which are also non perennial. The Kas river in Washim tahsil and flows South to join the Penganga near the village Masala. The Adol river flowing past Shripur and the Chandrabhaga are other small tributaries.

(I) Pus :

The pus river rises in the South Eastern part of Washim Tahsil and descend down the rugged plateau edge through a series of sharp bends controlled by the Penta gonal joints in the basalt, before leaving the district to enter Yawatmal district near the village Rui. The scarp on its banks has retreated by parallel recession to develop wide alluvial flats that are dotted with villages in the deep valley bottom, and are enclosed by hills to remain isolated in many parts. Its significant source tributary Bopalpandi river also rises in the district.

II) Adan :

It rises the Eastern part of Washim Tahsil and then flows towards East through the Northern parts of Mangrulpir Tahsil before entering into Darwha Tahsil of Yawatmal district.

The Arna and its tributary, the Kapti, rises in Mangrulpir Tahsil and flow East in the Southern parts to enter in Yawatmal district.

C) Lakes and Tanks :

These are not many perennial tanks or take depression within the district in the Penghat plains. A few are found around the villages Mardi and Purda both in the foot hill slope of Akot Tahsil, around the villages Banbada Budrukh, Kutasa both in the Shahanpur valley and Ghusar and Akhatwada both in a minor tributary valley on the left bank of the Purna.
A few deep perennial tanks are found in the trap country of the Washim plateau around Karanja, waked and Risod. All these appears to be small basins like depressions collecting the rain water from amphitheatre like basins supplemented springs.

D) Springs:

A number of springs occur on the Southern slope of the Balaghat plateau down to the Godawari valley. These springs occur at 500 meter level probably due to exposure of an interappear acuter. Not many springs are found on the Northern scalp slope. The river Purna and its tributary kate Purna, Uma, Pedhi, Morna and Mun are perennial river which are useful for the agricultural development. Penganga river is also perennial which is also fit for the development of agricultural of the study region.

2.7 Climate:

Some Geographers have argued that climate plags an important part in the development of nations economy through affecting the energy of land the stimulus too man in his various environment. Climate is also reflected in to habits and requirements of consumers and thus affects the prospects for consumer goods industries of various types.

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 productivity capability of a given area is dependent manly on the existing climatic and soil conditions. Since climatic factors exert mainly a regional influence on plant life, the differences in the behavior of a crop or a group of crops over extensive areas, as in a given state or a group of states may be considered as due primarily to differences in climate rather than soil conditions.
Similarly views have been put forward by many scholars. It would be worth taking note of them. 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 (Stamp 1963)\textsuperscript{11}.

As the climate of countries changes, so will its plants or crops (Thomas 1967)\textsuperscript{12}. The climatic elements and other effects on plant growth are far more complex than it appears. In the field, the plant is never subjected to a single variable at any given time, but has to interact with an almost infinite number of combinations of the elements (Charge 1968)\textsuperscript{13}.

There always exists a significant relationship between climate and crops because of the limits imposed on crop growth by the existing broad natural climatic conditions which in a wag determine the patterns of farm activity and crop production. The obvious reason is that field crop cannot escape climate vagaries drought harass etc.

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 (Hildreth et al 1941)\textsuperscript{14} and they may be treated as primary determinants of crop growth. Plant growth does not depend on limited variables but is controlled by various elements acting in combination at a time. All these factors we subject to accelerated fluctuations taking place from time to time, from season to season and from place to place. Consequently, they determine the type of crops raised and regional differences in crop associations.

The climate of the Akola district is characterized by a hot summer and general dryness throughout the year except during the South West monsoons season. The period from about the middle of November to the end of February
constitutes the winter season. The summer season extends from March to June. This is followed by the South West Monsoon season which extends up to the end of September. October and November constitute the post Monsoon seasons. There are a number of important elements of the climatic conditions. They are as follows:

A) **Temperature**

Temperature conditions have been for less erratic from year to year them rainfall conditions in each agricultural region.

However great annual ranges may be highly significant in different zones giving rise to two or more cropping seasons. Without suitable temperature conditions Germination of seeds and growth of plants are retarded. Temperature regulates all 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 (Kochhar 1967)\(^{15}\).

Each crop plant needs a certain number of effective that units for generation growth stalking, maturity and repairing. This is called the thermal constant and varies from crop to crop. Temperature above the maximum is therefore, effective in furthering the growth of a plant towards maturing and ripening.

The crucial air temperature is 6° C (Sclimper 1903)\(^{16}\) at and above which plants grow. It is also known as the crucial limit. In other words, at this air temperature active generation and growth of most of the useful crops
region. Ideal temperature conditions for crop production are between 18.3°C and 23.9°C. Low temperature can at best permit only a slow growth of plant.

There is meteorological observatory in the district at Akola and the data from this observatory may be taken as representative of the metrological conditions obtained in the district in general. Temperature rises rapidly after February till May which is the hottest month of the year. In May the mean daily maximum temperature at Akola is 42.4°C and the mean daily minimum temperature is 27.5°C. The heat in the summer season is intense during the day and the nights are comparatively tolerable.

**Table No. 2.1**

Month Wise Maximum And Minimum Temperature In Akola District And Humidity. (2004-05)

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<th>Month</th>
<th>Mean daily Maximum temperature</th>
<th>Mean daily Minimum Temperature</th>
<th>Relative humidity</th>
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<td>12.9</td>
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<tr>
<td>February</td>
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<td>March</td>
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<tr>
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(Source: Meteorological Centre Akola.)
Month wise Maximum and Minimum Temperature in Akola District (2004-05)

Graph 2.1
During the pried from April to June on individual days the day temperature rises up to about 46°C to 47°C. The afternoon heat is sometimes relieved by thunder showers. With the arrival of the South West monsoon in the district by about mid June there is an appreciable drop in the day temperature and the weather becomes pleasant. After the withdrawal of the monsoon the day temperature increases generally and a secondary, maximum is day and temperature is reached in October. However, night temperature decreases progressively after September.

Both day and night temperature decreases rapidly from October till December which is the coldest months in the year the mean daily maximum temperature during the this month is 29.3°C and the mean daily minimum temperature is 11.9°C In the year of the Western disturbances which move across North India in the winter months, cold waves affect the district at time and night temperature may go down to about to 2 to 4°C (Graph No. 2.1.)

The highest maximum temperature recorded at Akola was 47.8°C on May 1947 the lowest minimum temperature was 2.2°C February 1887.

B) Rainfall :

Rainfall is the dominant single weather element influencing the intensity and location of farming system and the farmers choice of enterprises. It also becomes a climatic hazard to farming when it is characterized with scantiness, concentration, intensity, validity and unreliability. It is all the more important in the minimal regions where average or normal rainfall is generally necessary for successful crop production. In such areas the system of crop productivity must be correlated more or less to the moisture factor (Klages 1958)\textsuperscript{17}. Rainfall effectiveness is usually expressed as the actual total rainfall minus the total possible evaporation (Monk house and Wilkinson)\textsuperscript{18}. 
The measure of rain that falls in any brief spell of time is normally much more significant than the average or actual totals over a long period. What matters is therefore, the concentration, intensity and reliability of rainfall and evaporation. These determine the effectiveness of rainfall either collectively or individually. Records of rainfall in the district are available for 13 Tahsil for period from 1980 to 2004. Table 2.2 records that there is variation in the distribution rainfall in entire study region.

(Table No. 2.2) reveals that mean annual rainfall of the study region was 847 mm from 1980 to 2004. It various form Tahsil to Tahsil. Below 800 mm to 900 mm Mean annual rainfall was recorded in Akola, Murtijapur, Karanja, Magrulpir.

Patur and Risod Tahsils between 1980 and 2004. Above 900 in., mean annual rainfall was observed in Barshitakli, Manora, Washim, and Malegaon Tahsils from 1980 to 2004(Map 2.4)

The co-efficient of rainfall variability is calculated by or following formula,

$$\text{co-efficient of rainfall variability} = \frac{S}{X} \times 100$$

Where $S =$ The standard deviation of rainfall during 15 years.

$X =$ The mean of rainfall during 15 years

It is observed form the table No. 2.2 the variability of rainfall ranges from 22.82% to 44.04% during the period of investigation. The lowest rainfall variability was recorded in Karanja (22.82%) during the period of 15 years.
<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Tahsil</th>
<th>Mean annual rainfall</th>
<th>Co-efficient of rainfall variability in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akola</td>
<td>800</td>
<td>31.50</td>
</tr>
<tr>
<td>2</td>
<td>Barshitakli</td>
<td>927</td>
<td>33.01</td>
</tr>
<tr>
<td>3</td>
<td>Akot</td>
<td>794</td>
<td>44.04</td>
</tr>
<tr>
<td>4</td>
<td>Telhara</td>
<td>769</td>
<td>35.7</td>
</tr>
<tr>
<td>5</td>
<td>Murtijapur</td>
<td>861</td>
<td>31.95</td>
</tr>
<tr>
<td>6</td>
<td>Karanja</td>
<td>882</td>
<td>22.82</td>
</tr>
<tr>
<td>7</td>
<td>Magrulpir</td>
<td>818</td>
<td>28.24</td>
</tr>
<tr>
<td>8</td>
<td>Manora</td>
<td>1021</td>
<td>24.87</td>
</tr>
<tr>
<td>9</td>
<td>Washim</td>
<td>927</td>
<td>27.11</td>
</tr>
<tr>
<td>10</td>
<td>Malegaon</td>
<td>990</td>
<td>28.88</td>
</tr>
<tr>
<td>11</td>
<td>Risod</td>
<td>897</td>
<td>31.10</td>
</tr>
<tr>
<td>12</td>
<td>Balapur</td>
<td>773</td>
<td>38.40</td>
</tr>
<tr>
<td>13</td>
<td>Patur</td>
<td>884</td>
<td>36.51</td>
</tr>
<tr>
<td>14</td>
<td>Akola Dist</td>
<td>847</td>
<td>33.56</td>
</tr>
</tbody>
</table>

(Source :- Computed by the author)
Rainfall Variability Akola District
1980 to 2004

Index
- Below 30%
- 30% to 35%
- Above 35%

Map 2.6
Below 30% Rain fall variability was found in Karanja, Mangrulpir and Washim Tahsils while 30% to 35% rainfall variability was found in Akola, Telhara, Balapur and Partur Tahsils during the period of investigation (Map 2.5). Above 35% rainfall variability was recorded in Balapur, Patur, Barshitakli, And Akot Tahsil between 1980 to 2004. The rainfall variability of Malegaon, Washim, Murtijapur and Karanja indicates that there is guarantee of agricultural crops.

C) Humidity :
Except during the South West monsoon season when the humidity is between 60 to 80 % air is generally dry over district. The summer months are the district when the relative humidity is even less than 20 % in the afternoons on many days.

D) Cloudiness :
The skies are heavy clouded to over East during the South, West monsoon season. In the latter half of the summer season and the post monsoon season there is moderate cloudiness particularly in the afternoons. In the rest of the year clear or lightly clouds skies generally prevail.

E) Winds :
Winds are generally light with some strengthening in speed in the latter part of the hot season and in the early part of the monsoon season. The winds are mostly from the North East or the East during the post monsoon and early cold weather seasons. By February, winds become Westerly to North Westerly and continue to be so till June.

In the South-West Monsoon, season winds from directions between South East and North-East are most common.
F) Special weather phenomena:

In association with monsoon depressions which originate in the many of Bengal and move from West to North West wars through the central part of the country, the district experiences strong winds and wide special heavy rain. Thunder storms occur in all the months of the year, their frequency being the East the during the months of the year, their frequency being during the last months of December and January and highest during the months of June, July and September. Less frequently storms and depression of post Monsoon months (October and November) also affect the weather over the district.

2.9 Soils:

Unlike Climate, soils should not be regarded as part of the natural endowment of an area. In fact it is agriculture that modifies soils, excepting certain virgin soils which can retain their original characteristics. On the whole, soils constitute the physical base for any agricultural enterprise. Farming is business and good soil is part of the farmer’s stock in trade. Good soils are good to extent that man makes Judicious use of them, our standard of living which predominantly depends on agriculture is after determined by a combination of the physical, chemical and biological characteristics of the soils and the crops and live stocks raised on them. (Map No.2.6.)

Thus, soils endowed with a proper combination of texture, structure, salts and humans yield good results. The soils provide essential material which agriculture is based and therefore any comprehensive survey of the geography of agriculture should include a fairly through treatment of soils. Even at the beginning of his work on political geography. Retail made a statement of great significance and insight ‘Jender staat ist ein stuck Menschhit (every nation is a bit of soil Mango, Karvanji and some of the Focus Species are often seen along road sides and being evergreens provide
most valuable shade during the hot weather. Salai is a common tree but is not much used either for the fuel or for timber. The fruits of the Bel Tembhumi Char and the various species of Zizyphus are eaten by the poorer classes. Mahua is largely used for the manufacturing of Country Spirit. Other species found in the forest are Ganher Rastwar, Ghyara, Baharuka, Rohan, Rusam, though this is vary scare Moi, Biba, Tiwas, Haldu, Ralamb, Rahu, some species is grow in the different part of the District.

Table No. 2.3

**Tahsil Wise Change In Forest Area In Akola District.**

*(Area In “00” Hectors.)*

<table>
<thead>
<tr>
<th>Name of Tahsil</th>
<th>1980-85 Area under Forest</th>
<th>Total Geographical Area</th>
<th>2000-2005 Area under Forest</th>
<th>Total Geographical Area</th>
<th>Volume of change in 1980-81 to 2004-05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akola</td>
<td>25</td>
<td>2.46%</td>
<td>24</td>
<td>2.18%</td>
<td>-0.28%</td>
</tr>
<tr>
<td>Barshi Takli</td>
<td>178</td>
<td>21.56%</td>
<td>59</td>
<td>7.54%</td>
<td>-14.01%</td>
</tr>
<tr>
<td>Akot</td>
<td>7</td>
<td>0.89%</td>
<td>24</td>
<td>3.02%</td>
<td>2.13%</td>
</tr>
<tr>
<td>Telhara</td>
<td>4</td>
<td>0.61%</td>
<td>7</td>
<td>1.20%</td>
<td>0.59%</td>
</tr>
<tr>
<td>Murtijapur</td>
<td>7</td>
<td>0.96%</td>
<td>9</td>
<td>1.13%</td>
<td>0.17%</td>
</tr>
<tr>
<td>Karanja</td>
<td>53</td>
<td>6.16%</td>
<td>16</td>
<td>1.87%</td>
<td>-4.29%</td>
</tr>
<tr>
<td>Magrulpir</td>
<td>50</td>
<td>6.54%</td>
<td>48</td>
<td>6.11%</td>
<td>-0.43%</td>
</tr>
<tr>
<td>Manora</td>
<td>87</td>
<td>10.56%</td>
<td>94</td>
<td>11.96%</td>
<td>1.40%</td>
</tr>
<tr>
<td>Washim</td>
<td>17</td>
<td>2.01%</td>
<td>19</td>
<td>2.06%</td>
<td>0.05%</td>
</tr>
<tr>
<td>Risod</td>
<td>19</td>
<td>2.09%</td>
<td>19</td>
<td>2.18%</td>
<td>0.08%</td>
</tr>
<tr>
<td>Malegaon</td>
<td>133</td>
<td>13.33%</td>
<td>129</td>
<td>14.17%</td>
<td>0.93%</td>
</tr>
<tr>
<td>Balapur</td>
<td>1</td>
<td>0.11%</td>
<td>1</td>
<td>0.15%</td>
<td>0.04%</td>
</tr>
<tr>
<td>Patur</td>
<td>121</td>
<td>17.29%</td>
<td>122</td>
<td>17.43%</td>
<td>0.14%</td>
</tr>
<tr>
<td>District Total</td>
<td>700</td>
<td>6.50%</td>
<td>571.06</td>
<td>5.46</td>
<td>-1.04%</td>
</tr>
</tbody>
</table>

Source: Computed by Author.

Therefore no student of civilization can afford to forget even for and instant the crucial importance of soils. These are the source of practically the entire stock of mans food, clothing and an ever increasing list of other needs.
So much so, that man gets nearly all of his food from the soils, less than one percent of what he eat, being fish (Person and Harper)\(^{20}\) of the long list of natures gifts to man productive soils and water are the most basic to human life (Bennet 1955)\(^{21}\). The top or upper large of soils has an average thickness of between 15 and 20 cm. depending upon local conditions. This is principal feeding zone of the crops, providing food human ingestion or live stock feeding.

2.10 Natural Vegetation.

1. The District Akola is not well wooded specially in the fertile plain country through which the Purna flows. But a fair number of trees and groves are scattered over it. The main track of forest runs along a range of hills which passes from East to West across the middle of the district about 20 miles south of Akola\(^{22}\). There are also a few babul bans containing scarcely anything but babul, a new areas of mixed growth and other areas reserved chiefly for the supply of grass. The growth in all the forest except the babul bans is deciduous, containing a variety of species. The most valuable specie is teak. Which is largely used for the posts and rafter of buildings. The tree unfortunately seldom grown to a large size in this district. It is generally unsound over matured and stageaded and is thus useless as timber. The species next is value to teak is in and the next again area Dhawara land and Bijasal. These are also used for building by poorer classes in villages. Behara and Harra are valued for their fruits, but the latter is not found in sufficient quantities for the exportation. Nim,
(A) Tahsilwase Change of forest area in Akola District.

Akola Tahsil area in forest is 2.46 %, in 1980-85 and Decrease in 2004-05 to 2.18 % whereas in Barshi Takli Tahsil area under forest is 21.56 % in 1980-85 and it decrease in 2004-05 to 7.54 %, Akot Tahsil area under forest in 1980-85 is 0.89 % and in 2004-05 is increase to 3.02 %. This Tahsil is decrease of area under forest because some changes in agriculture. Telhara area under forest is 0.61 % in 1980-85 whereas 1.20 % in 2004-05, increase 0.59 %. Murtijapur area under forest in 1980-85 is 0.96 % and in 2004-05 is 1.13 %, increase volume of change is 0.17%. Karanja Tahsil area under forest is 6.16 % in 1980-85 where as 1.87 % in 2004-05. Volume of Changes is 4.29 %. This is highest change of forest area in Akola District. Manora, Washim, Risod, Malegaon, Balapur, Patur Tahsil area under forest is increased comparatively 1980-85 to 2005-05 total Akola district area under forest is 8.50 % in 1980-85 whereas in 2004-05 area under forest is 5.46 %. The volume of change is 1.04 % because lack of Rainfall.
References.
4. Gazetteer of India, Maharashtra State, Akola District, 1977, P.16
11. Stam (1963)


