2.1 INTRODUCTION

Aknoor Forms one of the tehsils of Jammu district bifurcated into Kandi and plains region. Kandi experienced undulating, dissected relief, bearing the rills, gullies and non perennial rivulets flow from north east to south west. Aknoor is the tehsil headquarter situated on the right bank of Chenab from where it debouches in the plain and spread over miles to traversed over 30 kms. and enters the boundary of Pakistan. The significant contribution of this perennial river bifurcated, the tehsil into almost in equal parts i.e. Pargwal (27) and Khour & Pallanwala comprising (63) village. The south western part in demarcated by Menawar Tawi (across the lines of actual control the area of (Aknoor tehsil) Chamb, Menawar and Devabatala geographical known as Chibbali region which is part of Pakistan occupied region of Jammu province) and joins Chenab after traversing 18 Kms. This way the perennial river also provides source of assured irrigation in the plain, forms an extension of Rachana Doab. The relief, geology, crops, population distribution the basis of regionalization. Paddy, maize, fodder, pulses, sugarcane, oilseeds (gaurds, melons, water melons, lady fingers) are the kharif crops. It is interesting to note here that Pargwal historically preponderance commercial and non cereal crops, Sialkote was nearest market centre, Tobacco, Dania, Onion, Oilseed, ginger, cotton, Sugarcane were the crops and the farmers used to depend on their earnings.

The proximity from Sialkote and delinked from Jammu and Aknoor before partition Pargwal used to be a regional market centre. The Partition brought out radical transformation in the landuse and the economy. Pargwal linked by all weather surface metalled network to Jammu and Aknoor and by navigable boats to Khore area. Wheat, oil seeds, vegetables, lady fingers have gained its preponderance in rabi season.

2.2 GEOGRAPHICAL LOCATION

Aknoor Tehsil divided into two developmental blocks on the basis of homogeneous geographical phenomenon i.e. Aknoor and Khore and consists of 205 villages. Tehsil regionalised on the basis of Dudley stamp approach physiography,
geology and climate. The average altitude of Shiwalik Akhnoor in 360 mtrs, whereas plain recorded 270 mtrs. Fig. 2.1 depicts the geographical location of the area under scrutiny.

Tehsil lies in the sub shiwaliks and plains and situated on the north western side of Jammu district is about 30 kilometers away from Jammu city of temples. The tehsil extends from 32°50'52" to 33°44'20" N lat. and 74°15'10" to 74°44'20" E long. On demarcating eastern boundary, Dansal, Bhalwal and Marh block, Reasi in north east, Rajouri in the north and, international border in the south. Chenab river forms gorges in upper slopes and rich in hydro power potential; Salal, Baglehar and Dulhasti projects are the economic life line of the Jammu province.

Akhnoor consists of Shiwalik hills, foothills are formed by diluvium, depository (altitude 272-561m) and fertile plain (altitude 260-268) lies almost parallel to the mountain ranges. The ravines and gullies originating from hills of shiwaliks and ultimately joins with Chenab river and its tributaries, run across the plains, dissected by the series of deep and shallow ravines and rivulets, their width ranges from few to several hundred meter. The bed filled with sand, gravel and boulders with clamps of wild growing tall grass. In the rainy season rivulets are over flooded and carries enormous volume of sand, mud, boulders and finer clay.

2.3 GEOLOGY

Morphology plays an important role in the cultivation of crops (agriculture) the form of the terrain throws illumination on the landuse, population growth, distribution and variety of agricultural crops. Geology of the land exercise direct influence on landuse particularly through elevation, ruggedness and slope affecting the agricultural technology and investment. Fig. 2.2 has revealed the geology of the tehsil as Alluvial Plain, Shiwalik Hills, Flood Plain, Piedmont Zone and Structural Hills. The geology has determined the special pattern of agriculture and soil.

2.3.1 Plains

The southern part of area is low lying and is the extension of Rachana Doab and encounters hilly tracts dissected by seasonal rivulets. The plains dissected by
series of deep, shallow ravines, the river debouches from Akhnoor and breaches the plains by its distributaries in left bank. The sediments comprises boulders, debris, pebbles, cobbles, gravels, sand and clay lightly assorted fashions near the hill and shows stratification with distances from the hills. The plains include flood plains, terraces (irrigated) and sirowal. These are located on the bank of river Chenab, laid down over Sirowal zone consisting of material heterogeneous clastic in texture. The area of Bhal Moolu, Pargwal and Gurah Manhasa includes such deposits. Fig. 2.3 self speaking the lithological pattern in the area Alluvium, Conglomerate have preponderance of the distribution pattern whereas sand stone with clay and silt have reported in significant spatial coverage.

2.3.2 Kandi (Shiwaliks)

The northern part forms Shiwalik hills was formed after the rise of Himalaya. The rivers draining these Himalayan heights brought huge quantity of debris with them piled it up in the Shiwalik zone. It consisted mainly of clay and boulder of different sizes. This fluvial debris was later on subjected to folding which resulted in the formation of a series of low parallel ridges, the Shiwalik hills. Hills slopes towards the plain covered with boulders and clay. On inner side these hills end abruptly and the rocks are mostly grey sandstone. The outer slopes are covered with evergreen bushes and bear an open scrub forest.

The Shiwalik hills like the outer plains also dissected by ephemeral rivulets and streams. The lower slopes of these hills average altitude of 300-700 constitute the shiwalik and local language (Dogri) called kandi, characterized by thirsty soils, a very low water table altitudinal frequencies occurs everywhere. In the Shiwalik, the slope of the soil from 3° to 6° and in the plain it ranges from 1° to 3°. Vegetation cover, xerophytes predominant. Agriculture entirely rainfed and determines the low socio economic level of and reflection of poverty.

The Shiwaliks formations composed of fine grained sandstone, pebble beds, and upper most boulder bed of boulder Conglomerate with southerly and westerly
dips ranging from 40° to 60°. The deposits at the top are much coarser than down the gradient.

2.4 SOIL

Soil represents diversity because of its parental rock material and alluvial deposition. The Shiwalik have sandy stony and mixed clayed deposited by Himalayan river before the origin of Shiwalik. The outer plains have a deposition of alluvium brought from upper slopes by Chenab and its distributory deposited in the form of plains plain and rich in agricultural efficiency and capacity. The alluvial forms clayed sandy, de alluvium and have attracted higher population distribution responsible for higher productivity of cereal and non cereal crops. Fig. 2.4 have reported the soil, classification and spatial pattern coarse loamy, fine, fine loamy, loamy skeletal and sandy. The sandy soil concentrate only in the rivulets and basal of the river Chenab. Pargwal and Khour have reported the alluvial soil the depth of the soil is Pargwal is higher as compared to Khour.

A generated classification of the soils with major types has been evolved by the soil survey organization of agriculture department of the state. Soil classification have been elucidated hereafter.

2.4.1 Light Yellow or Dark Brown and Grayish Brown:

It is also known as longotian soil characterized by surface texture ranges between sandy loams to silty clay loam. This is most suitable for Bajra, pulses, oilseeds.

2.4.2. Sandy Loam to Loam:

The colour ranges from pale to dark yellowish brown. These soils have low content or organic matter and respond efficient the application of nitrogen fertilizers. These soils are suitable for cultivation of paddy, Wheat, oilseeds, barseen.

2.4.3. Sandy Soils:

These are coarse texture soils and varies from sandy loam to loamy soils. Sand is predominant constituent and varies from 62% to 82%. And suitable for pulses til, bajra.
2.4.4. Silti Loam:

Surface texture of the soils varies between silt loam to loam sand and some places lower layer shows clay content and this type of soil found in the plains and suitable for paddy, wheat, vegetables, etc.

2.4.5. Coarse Loamy Soil:

These soil are confined mostly the north and central parts of Akhnour tehsil. suitable for wheat, pulses, oilseeds, etc.

2.4.6. Fine Loamy Soil:

The soil category is found in the south and western parts of whole tehsil, this soil rich in agricultural efficiency and capacity. The soil is suitable for paddy, Wheat, barseem, oilseeds, etc.

2.5 Drainage

The river Chenab is the only perennial river originate from Pir Panjal ranges forming gorges and provides water fall to generate hydropower as Salal, Baghelhar and Dulhasti hydro on the upper-slopes of the river. after confluence Chander and Bhaga Tributries in Himachal Pradesh known as Chenab and the most important perennial river of this region and have tremendous potential for hydro power.

Chenab perennial river, which enters in the tehsil in the east northern side and flowing through the central parts. The river Chenab gets flooded frequently especially in rainy season. Ranbir and Partap canals have been constructed on the left and right bank of the river respectively. Partap canal is the main source of an assured irrigational facilities in the khore block in the plains. Munawar Tawi which is the main tributary of Chenab river and joins along the right side after debouches in plains. There are numerous seasonal streams known as rivulets. The main rivulets are Dongrewali, Loakhi, Lamhi. Similarly ephemeral drainage forms the dendetertic and trilesies drainage pattern, because of variation in geological structure. Chenab forms antecedent drainage like other sister perennial Himalayan streams spread over the higher catchment/watershed forms nurseries of glaciers (kol and others) and
banks of the rivers of the plains the life line of the society, economy and cradle of Indus civilization.

2.6 CLIMATE

Climate is the principal aspect of physical environment affecting landuse. The main element of climate are temperature, rainfall, humidity and sunshine.

2.6.1 Temperature:

The tehsil experiences cold weather conditions in the month of December and January. When air temperature is likely to be about freezing point during the nights. May and June are the hottest months of the year. Hot wind blows in May June locally known as and important characteristics of tehsil.

<table>
<thead>
<tr>
<th>Month</th>
<th>1980</th>
<th>1990</th>
<th>2001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Max</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>January</td>
<td>18.9</td>
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<td>February</td>
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<td>March</td>
<td>26.1</td>
<td>13.8</td>
<td>26.1</td>
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<tr>
<td>April</td>
<td>32.3</td>
<td>18.9</td>
<td>32.9</td>
</tr>
<tr>
<td>May</td>
<td>38.3</td>
<td>24.0</td>
<td>38.0</td>
</tr>
<tr>
<td>June</td>
<td>40.7</td>
<td>27.0</td>
<td>42.4</td>
</tr>
<tr>
<td>July</td>
<td>40.0</td>
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<tr>
<td>November</td>
<td>24.5</td>
<td>12.4</td>
<td>26.5</td>
</tr>
<tr>
<td>December</td>
<td>24.5</td>
<td>7.9</td>
<td>20.9</td>
</tr>
</tbody>
</table>

*Source: District Statistical Handbook Jammu*
2.6.2 Rain

Rainfall is the determinants aspect of agricultural crops grown in kharif and rabi seasons, where rainfall is high and means of irrigation facilities are available and in those areas having insufficient rainfall and irrigation facilities are not available, the conditions become of draught and sometime crop failure. So, water resources are vital organ, in practically every aspect of agriculture. Higher concentration in the form of rain confined july, august months of the year.

Table: 2.2
Akhnoor Tehsil Mean Monthly Rainfall.

<table>
<thead>
<tr>
<th>Month</th>
<th>Rainfall (cm) 1990</th>
<th>Rainfall (cm) 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>54.19</td>
<td>55.80</td>
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<tr>
<td>February</td>
<td>54.49</td>
<td>59.7</td>
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<td>March</td>
<td>82.62</td>
<td>115.10</td>
</tr>
<tr>
<td>April</td>
<td>14.12</td>
<td>8.10</td>
</tr>
<tr>
<td>May</td>
<td>34.72</td>
<td>38.0</td>
</tr>
<tr>
<td>June</td>
<td>33.66</td>
<td>110.80</td>
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<tr>
<td>July</td>
<td>333.00</td>
<td>526.00</td>
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<tr>
<td>August</td>
<td>355.00</td>
<td>158.00</td>
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<tr>
<td>September</td>
<td>127.0</td>
<td>359.12</td>
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<tr>
<td>October</td>
<td>40.11</td>
<td>210.10</td>
</tr>
<tr>
<td>November</td>
<td>18.61</td>
<td>102.04</td>
</tr>
<tr>
<td>December</td>
<td>141.05</td>
<td>59.8</td>
</tr>
</tbody>
</table>

Source: District Statistical Handbook Jammu

The inadequacy of moisture in July and August results in the crop failure in general and paddy in particularly, rainfall in the months of September and October becomes very important for sowing of rabi crops as well as for quality and yield of Kharif crops, Heavy rainfall may lead to water logging while precession of rains
may cause postponement or restrictions on sowing of summer crops in the irrigated areas.

The climate of tehsil on the bases of temperature and rainfall has been divided into four seasons:

a. **Summer**
b. **Autumn**
c. **Winter**
d. **Spring**

### 2.6.3 Summer Season:

The Summer season is restricted to four months starting from mid May-mid September and its impact can been in every part of the study area. This season is very unpleasant and is dominated by westerly dry winds. The nights are uncomfortable and days are marked by intensive heat. The average maximum and minimum temperature of this seasons are $37.5^\circ C$ and $28.5^\circ C$ respectively in 2001. June is the hottest month of the season as well as of the year with temperature ($43.6^\circ C$) May and June are very harsh months. The excessive heat has desiccating influence on the vegetation. May and June in this season are characterized by Andhi or high speed dry winds/tufan are common phenomena which raises huge cloud of dust in the sky. The weather in March and April is suitable for ripening, thrashing and winnowing of the Rabi crops. This period is characterized by high temperature, low relative humidity and almost no rainfall, and dust laden piercing very hot winds locally called ‘Loo’ makes the outdoor activity almost stand still.

### 2.6.4 Autumn

This season starts with the retreating of monsoon in mid September and ends in mid November. The mean maximum and minimum temperature $29.5^\circ C$ and $17^\circ C$ respectively. This season receives little amount of rainfall and dry temperature drops down rapidly in afternoon relative humidity also decrease. This season is characterized by cool nights, warm days, clear skies, long duration of sunshine, the amount of rainfall in small but it is of distinctive significant for the crops.
2.6.5 Spring

This season extends from mid March to mid May. In the beginning of season i.e. March, the weather starts to rise constantly due to usual shifting of solar radiations towards the north. The average maximum and minimum temperature of the season is 30.3°C and 18.2°C respectively. This season receives a little for the crops which provides moisture to the soil and helps the crops to improve the yield by improving its grain size of crops. Shift winds, crops winnowing here.

2.6.6 Winter

This season lasts for four months starting from mid November to mid February. Colour sky, fine weather, Low humidity and large diurnal variations in temperature are common characteristic feature in cold winter. The temperature (both day and night) starts to go down from November and continuous to January. The average maximum and minimum temperature in winter are 23.3°C and 11°C respectively. December and January are the coldest months of the year when minimum temperature decreased to 2-3°C sometimes in January, February. In this season the rainfall is caused by western disturbances, the nomenclature given to temperature cyclones approaching India from Mediterranean Sea and Atlantic Ocean. Low temperature coupled with high humidity during these rain renders the weather very uncomfortable. But this rainfall is very beneficial for the crops as it helps in the growth of the crops. The month of mid December and January are characterized by heavy dew and intense frost which adversely affects the growth of winter crops. Besides Fog during extreme chilly days and haze are common phenomena of season. Agricultural activities remained stand still because of inclined weather conditions.

2.7 Flora

The distribution of weather conditions determinate the vegetative growth. The rainy season have a luxury growth because of higher precipitation in the form of rainfall in the advancing stage of monsoon. The shiwalik regions have bushes grown on the undulating topography. The main species are Gharna, pine, phulai, banyan Bher, Brainker, Saroot, Phulai, santh, cactus, bhang, kikar, tali, Guava, sarin, tallan,
Draink, mulberry, Mango tree, Plah, Auk, plains have devoid of thorn bushes and the major are seesham and mango which are very costly (useful for agricultural and helpful for construction). Shrubs found in the lower part of the area are mostly dense and the mostly mixed with scattered broad leaved trees.

The Sprawl of vegetation species found here directly influenced by the lithology, rock structure, altitude, aspect of slope, insolation and general the edaphic and geo-ecological conditions. The influence of these factors is pronounced. Consequently, there is great heterogeneity in flora, marked variation in their density and spatial distribution. The flora species and their density differ from slope to slope with in a small distance. The flora comprises sparse and dry scrub of the shiwaliak foot hills (400-600m). The deciduous forest of higher altitudes (600-700m). The deciduous forest are found in northern part of the area-running in the east-west direction. The pine is sparsely distributed extreme northern shrubs and grass land are found in the eastern part of the tehsil.

2.8 AKHNOOR - HISTORICAL BACKGROUND

Akhnoor was King Virat's residential palace during the Mahabhatta period. It is situated about 30 Kms in the north western side of city of temples and winter capital of the state. It is situated at the slope and bank of river Chenab on which majestic king known as Sher-e-Panjab Maharaja Ranjit Singh made Dogra soldier Gulab Singh, the King of Jammu from that the concept of Dogra State concept came into existence.
The Ancient site Ambaran locally known as "Pambaran" (Lat. 30° 54' N and Long. 74° 46' E) is located near Akhnoor about 2½ kilometer in the northern eastern in the right bank of Chenab (Ancient Asikni or Chanderabhaga) river terraces and about 27 kms from north west of Jammu river Chenab in between two rivulets (khad in Dogri/local language) which come down the hill and join the river. The site is about 100m in width from north south. On either side of the river there are middle Pleistocene boulder conglomerate deposits over which there are loose boulders and pebbles mixed with sand, silt and clay belonging to the late Pleistocene period which is the natural soil below the cultural deposits.

The Archaeological Survey of India, Gandhi Nagar Jammu Circle has carried out scientific excavation for two seasons (1999-2000 and 2000-2001) to know the association and stratigraphic position of the famous Akhnoor terracotta heads with the Buddhist Monastic establishment at Ambaran and to study the layout and plaining of the site, believed to the only early Buddhists in the Jammu Region.

During the excavation burnt brick structures of various phase were encountered. The site seems to have been
abandoned sometimes around 7th century A.D. Mainly due to flash floods in the river and decline of Buddhism in the area. The excavation revealed the cultural sequence of the following periods:

**Period-I:** Pre-Khushan period (circa second first century B.C.).

**Period-II:** Khushan period (circa first to third century).

**Period-III:** Post-Khushan (Gupta) period (circa forth fifth century A.D.).

**Period-IV:** Post Gupta period (circa sixth seventh century A.D.).

**Period-I:** No Structural remains of period-I were found. The thin deposit contained grey ware shreds of bowls and red ware vases.

**Period-II:** Buddhist monastic establishment was found at the site in period-II. A stupa, votive stup and walls of a monastery were exposed which are all built of burnt brick masonry with brick size usually 36 to 38 x 6 to 7cm.

**Period-III:** Two distinct structural phases of period-III were also noticed, the first having structures with bricks measuring 7 x 21 x 28cm in general and a second phase with bricks and brickbats of earlier structures re-used. Remains of an entrance of some important complex, stone pitched pathway were also found. Square base of a votive stupa measuring 2 x 2 sq. mt. along with evidence of its circular shaped structure was found.

**Period-IV:** (circa sixth century A.D.) The large complex, possibly a monastery, party survived during this period when addition and alterations were made in its originals structures and repairs were also carried out after the flash floods.

Pottery of period II to IV does not have much difference in shape, fabric and slip except that in the last period rims of bowls become sharp and straight. Important shapes are basins, bowls, sprinklers, vases lids, lamps, spouts and
storage jars. Stamped designs have also been found. Amongst the spout with
grotesque animals head and the pot legs and interesting piece bears head of a lion.

Among important antiquities a large number of decorative terracotta
figurines, terracotta moulds of human figurine, leaves and ornaments, terracotta skin
rubber, beads and gamesmen, iron nails, hooks and rings, copper objects,
semiprecious stone beads have found. A small stone sculpture in Gupta style showing
a male attendant holding some objects in his right raised hand and the left resting on
his thigh. Copper coins belongs to the Kushan rulers Soter Megas, Kanishka and
Huvikshka were found during the excavations. The unique discovery of relic caskets
during the excavation has opened a new chapter in the study of history and culture of
the region as it is for the first time that in the province of Jammu such significant
Buddhists remains have been found. The reliquary with three containers copper, silver
and gold caskets which could fit into one
another was found to be 2.4cm high with
its diameter being 5.6cm which comprise
30 circular thin sheets of gold, 2 silver
and 130 micro beads of pearl, 12 coral
and 2 metallic, oval shaped silver casket,
a circular gold casket, a bead of
amethyst and 3 encrusted copper coins.

Most significant and distinguished Buddhist bricks structure spoked wheel
stupa has the exposed during the scientific clearance work at Ancient Buddhist site
Ambaran, which is discovered for the
first time in the Northern part of India
Sub-continent of Jammu. It measuring 4
meter radius spoked stupa having 8
spokes inside each measuring 0.80
meter made of re-used bricks of different
size and filled with pebbles. Its outer periphery is almost 1.20 meter bricks wall with mud mortar which are partly missing due to later occupation. The remains of platform are available and superstructure is missing. On the eastern and southern side pebble paved passages are encountered. The exposed bricks structure is similar famous excavated stupa of Nagarjunakonda in south India and Sanghol in Panjab. Besides the main stupa on the eastern side a seven course brick structure of Gupta period has also been exposed.

Historical information of Reliquary found during excavation speaks stupa, votive stupa, general view, conjectural stupa and terracotta human limbs eloquently proven credential is one of the ancient Buddhist site in Indian history at Ambaran Akhnoor tehsil under scrutiny in the history of mankind.

*Source: Archaeological Survey of India Srinagar Circle (J&K) 141 A/D, Gandhi Nagar, Jammu.*

Akhnoor town situated at 2½ km below the ancient Buddhist excavation on the right bank of Chenab river. The ancient fort believed to have been constructed in contemporary with the other forts of India. The magnificent ancient tunnel which is famously known as Pandavas cave it is hearsay that the Pandavas used to live here in their exile. There are also some important historical temples on right bank of Chenab river believed to be in the era of Mahabharata.
REFERENCE

Archaeological Survey of India Srinagar Circle (J&K) 141 A/D, Gandhi Nagar, Jammu.


