CHAPTER I

PHYSICO-SOCIO-ECONOMIC BACKGROUND

Being an open activity, agriculture is influenced more by natural forces than any other economic activity on the earth. However, man is not passive in a given environmental set up. With the available technology and other resources at his command, he reacts to the surrounding natural forces and tries to utilize them for his benefits. Agricultural patterns in an area are the resultant outcome of the complex interplay of physical and socio-economic forces. Thus, an overall assessment of the physical and socio-economic setting is a pre-requisite for comprehensive understanding of agricultural geography of a region.

The Land

Physiography

Barring only 12.8 per cent of its total area which consists of low hills, the whole of the Bist Doab is a flat plain (Map 1.1). Physiographically, it may be divided into two major regions (Map 1.2):

1. The hills
2. The plains

1. The hills

The hilly zone, as stated above, covers only 12.8 per cent of the total area of the Bist Doab. It runs in a narrow belt along the eastern boundary of the region. The Kandi-Rakkar assessment circles of Dasuya, Kandi circle
BIST DOAB
PHYSIOGRAPHIC REGIONS

1 The Hills
2 The Plains:
(a) the foothill plain
(b) the upland plain
(c) the flood plain

MAP 1-2
of Hoshiarpur, Kandi and Beat Manswal circles of Garhshankar and Kandi circle of Balachaur tahsil fall within this terrain unit. It varies in elevation from 500 to 750 metres. The hills are composed of conglomerates, sandstone and clay and thus have loose strata. This fact coupled with scanty natural vegetation has resulted in their severe erosion by the running water. The hills are so badly denuded that they give an appearance of a bad land topography. Underground water-table in this physiographic region is very deep. Agriculture depends mostly upon rainfall. Due to unfavourable physical setting for agriculture, a limited proportion (about 25 per cent) of its area is available for cultivation. Agriculturally, it is the least developed area of the Bist Doab.

2. The plains

The plains cover 87.2 per cent of the total area of the Bist Doab. They range in elevation from 500 metres in the northeast to 213 metres in the southwest. The alluvial soils of these areas are fertile, easily workable, respond well to irrigation and fertilization, and therefore are excellent for raising crops. These areas in general are flat. But on the basis of micro-variations they may be subdivided into three parts:

(a) the foothill plain
(b) the upland plain
(c) the flood plain

(a) The foothill plain, as its name indicates, is located immediately next to the hills towards their west. It runs along the hills in a narrow belt and covers parts of Dasuya, Hoshiarpur, Garhshankar and Balachaur tahsils. It slopes from the hills to the plains, and varies in elevation from
500 metres at the foot of the hills to 250 metres towards the plains. A large number of seasonal streams emanating from the neighbouring hills traverse this subregion. As a result, it suffers from large scale dissection and soil erosion. The sub-soil water is deep and inadequate. Degraded soils, considerable dissection and deep water-table have restricted the development of irrigation and agriculture in this part of the Bist Doab.

(b) The upland plain terrain unit covers central part of the Bist Doab. It accounts for about 47 per cent (roughly 4,100 square kilometres) of the total area of the study region. It encompasses most of the Jalandhar district and adjoining parts of the Kapurthala district. This area is a vast featureless, flat plain with elevations varying from 216 metres in the southwest to 234 metres in the north and to 277 metres in the southeast. It is composed of deep alluvium. The depth of sub-soil water in this tract ranges between 5 and 10 metres. The acquifers are full of water and thus furnish a rich reservoir for the development of tube-well irrigation. Being gifted with flat topography, highly fertile deep alluvial soils and rich reservoir of sub-surface water, it is the most intensively cultivated and agriculturally the most developed part of the Bist Doab.

(c) Locally known as bet, the terrain unit associated with flood plains runs along the Beas and the Satluj rivers. It constitutes 14.7 per cent of the total geographical area of the Bist Doab. The bet of Beas is more marshy and wider in extent as compared to the bet of Satluj. The latter is wider in the east, narrow in the centre and widest in the west. This landform region is slightly lower in altitude than the upland plain. Its loamy and silt
loam soils are very fertile. Water-table is high. At places it is less than one metre deep and creates waterlogging. The flood plain region is highly suitable for the cultivation of rice during kharif season and wheat during rabi season. After the check on floods through building of dams across and embankments along the courses of both the rivers, this region has outranked the upland plain in the cultivation of these crops.

In sum, the Bist Doab is divisible into two physiographic divisions: the hills and the plains. The hills cover a small part of the region. They are badly dissected and problematic from the viewpoint of agriculture. The plains are better. However, the foothill part of the plains is badly dissected and exposed. Thus it is less productive than other parts of the plains. The upland plain is flat, fertile and furnishes convenient tract for agricultural operations. Agriculturally, it is the most developed part of the Bist Doab. The flood plains, which are relatively low-lying, are transitional to the upland plain and foothill plain in terms of agricultural resource base and development.

**Drainage**

Drainage lines of the Bist Doab range from the long perennial rivers to seasonal streams of a few kilometres in length. The Beas and the Satluj are the two major rivers which mark its western and southern boundaries respectively.

The Beas river originates from near Rohtang Pass, at an elevation of 4,061 metres in Kulu district of Himachal Pradesh (India). After traversing a long distance in Himachal Pradesh, it enters the Bist Doab near Talwara (Hoshiarpur district). From here it flows parallel to the boundary between the Bist Doab and Himachal Pradesh, towards north for about 50 kilometres.
after which it takes a southwesterly turn and flows all along the western boundary of the region before joining the Satluj at Harake in Amritsar district of the state.

The Satluj is another important drainage channel of the Bist Doab. It originates from the Mansrower lake in the Great Himalayas (in Tibet), located at a height of about 7,754 metres (25,355 feet) above sea level. After moving along the southern slopes of Kailash mountains, it enters Himachal Pradesh through Shipki La Pass. After flowing for a long distance through this state, it enters Punjab at Nangal. From here onward, it flows towards south upto Ropar, through Anandpur Sahib Doon and then takes a sharp westerly turn. Beyond Ropar, it demarcates the southern boundary of the Bist Doab. It joins the Beas at Harake, beyond which it leaves the study region and flows along the international border between India and Pakistan, to finally join the Indus river.

Both these rivers are perennial. But their discharge fluctuates widely from season to season. Their flow is minimum during winters and maximum during summer monsoon season. Prior to their damming, they were subject to frequent floods during rainy season. The construction of dams (the Pong Dam across the Beas near Talwara and the Bhakhra Dam on the Satluj at Bhakhra) across and artificial embankments along their courses have rescued the bet areas from the menace of floods. Their waters have been harnessed for generating hydroelectric power which has gone a long way in rural electrification and developing power irrigation. This apart, a number of irrigation projects have been extended from them. The Bist Doab canal system is one
such project which takes its water from the Satluj at Ropar. Almost whole of the canal irrigation in the Bist Doab is provided by this system.

Apart from the mighty rivers discussed above, two tributaries of the Satluj namely the White (east) and the Black (west) Bein are also important drainage channels of the Bist Doab. The White Bein originates from near Garhshankar, where a number of seasonal streams confluence. It flows through Phagwara, Jalandhar and Nakodar tahsils of the region before joining the Satluj near Lohian. The Black Bein takes its birth from Terkiana lake in Dasuya tahsil. Running parallel to the Beas in Kapurthala and Sultanpur Tahsils, it demarcates the boundary between flood plain of the Beas and the upland plain. It joins the Satluj near Harike. Both these Beins are sometimes flooded during rainy season.

Besides the above stated major drainage lines, a large number of seasonal hill torrents (locally known as choes), constitute a part of the drainage system of the Bist Doab. After descending from the hills, these choes traverse the foothill plain. Most of them disappear after moving a few kilometres into the porous strata of this rolling plain. Only a few bigger ones join together to reach the rivers. As pointed out earlier, the choes dissect the foothill plain and bring considerable soil erosion. During recent years, a number of them have been channelized and their courses have been narrowed down through artificial plantations. This has reduced the intensity of floods in them.

Climate

The Bist Doab, like Punjab of which it is a part, has sub-tropical
continental climate with monsoonal regime of precipitation. Its winters are cool and relatively dry whereas summers are hot and wet. Through temporal and spatial variations in rainfall and temperature, the climate of this region strongly influences its agricultural landscape.

**rainfall**

Like that of Punjab, rainfall in the Bist Doab is inadequate, seasonally concentrated and unreliable. Annual average amount of rainfall at various stations in this region ranges between 57.9 centimetres at Phagwara and 96.1 centimetres at Hoshiarpur. Nearly 65 per cent of it comes during monsoon months of July, August and September. A good part (15.7 per cent) out of the rest is associated with the winter months of December, January and February, and is brought by the western cyclones arising in the Persian Gulf and the Mediterranean sea. Not only over time, rainfall varies over space too (Map 1.3). The hills and their neighbouring plain receive more than 90 centimetres of rainfall. Its amount decreases gradually towards the southwest to a minimum of 60 centimetres. The coefficient of variability of annual rainfall is 26 per cent in the east and its value increases to 32 per cent in low rainfall areas in the southwest (Map 1.4). In response to inadequate and unreliable rainfall, the people and the government have made concerted efforts to develop irrigation. The spatial variations in the cropping pattern in the Bist Doab, to a notable extent, are associated with the variations in its rainfall.

**temperature**

The region does not exhibit greater spatial variations in the degree of coolness or hotness at any time of the year, though the seasonal variations
BIST DOAB
Mean Annual Rainfall

NOTE: BASED ON DATA FOR THE PERIOD 1951-78
NOTE: BASED ON DATA FOR THE PERIOD 1951-78
in this regard are well marked. Due to its interior continental location, the summers in the Bist Doab are very hot and winters are cool. With an average monthly temperature of 33°C (91.4°F), June is the hottest month. Highest temperature during this month touches 45.5°C (114°F). The level of mercury starts falling with the onset of monsoons during the last week of June or first week of July. It fluctuates around 25°C (77°F) during rainy season after which it gradually comes down. January with mean monthly temperature of 12°C (53.6°F) is the coolest. Lowest temperature during this month goes down to -2°C (23.4°F). Low temperatures are associated with cold waves. Such a weather brings frost which of course is neither very common nor severe. But it harms sensitive crops, such as vegetables and sugarcane.

In general, temperature remains favourably high the year round, enabling cultivation of crops without break. It does not vary at a time in different areas of the region and thus plays a minor role in areal variations in its agriculture. But it varies significantly over time and results in two distinct seasons of winter and summer. Associated with these are the two crop seasons of rabi and kharif respectively. Seasonal variations of temperature provide an opportunity to grow a diversity of crops during the year.

Sub-soil Water Depths

The depth, quantity and quality of sub-soil water indicate the potential for the development of minor irrigation. Fortunately, the Bist Doab is bestowed with a rich reservoir of this resource. Sub-soil water level in the region experienced ups and downs during the study period. It came up during 1951-66 (Map 1.5 and 1.6). At places it came too close to the surface to create
BIST DOAB
SUB-SOIL WATER DEPTHS
OCTOBER, 1951

Source: Land Reclamation, Irrigation and Power Research Institute, Punjab
waterlogging and thus interfered with crop cultivation. Heavy incidence of rains during early fifties, extension of canal irrigation in some parts and consequent increase in seepage, faulty construction of roads which obstructed the natural run off thereby enhancing percolation, largely explain this fact (Singh, 1975). But water level started sinking after 1966 and the trend is continuing. Exploitation of this resource on a massive scale through the development of tube-well irrigation is responsible for this. In 1980, the depth of sub-soil water varied between 5 and 10 metres in most parts of the Bist Doab (Map 1.7). The continued depletion of this resource is a matter of serious concern. Deepening of ground-water level has enhanced the cost of installation of tube-wells and of pumping out water. Such a trend needs to be checked through proper planning.

Vegetation

Due to ever increasing pressure of population on land, natural vegetation in the Bist Doab has been cleared for developing agriculture and providing more space for expansion of settlements. Hilly areas and the adjoining foothill plain, however, still maintain a considerable cover of natural vegetation. Nearly 84.0 per cent of the total forested area (52,824 hectares) of the Bist Doab is found in these tracts. Natural vegetation of these areas is interspersed with planted trees. Vegetation in the plains is largely seen along roads, railways, canals and around settlements. Most of it is planted.

Almost whole of the vegetation of the Bist Doab is of deciduous type. Trees like *kikkar* (*Acacia arabica*), *shisham* (*Delbergia sisson*), mulbury, *jamun*, *jamoa* (*Eugenia jambolana*), *mango*, *bohr* (*Ficus benghalensis*), *pipal*
(Ficus religiosa), eucalyptus and poplar are commonly seen. The wood of most of these trees is used for making furniture and fixtures for constructional purposes. It is also used as fuel by the people. Bohr and pipal are grown for shade. Eucalyptus and poplar are recent additions into the flora of the region. These are generally planted along the banks of seasonal streams and on hill slopes to check surface run off and soil erosion in the affected areas. Areas along canals, roads and railways too are planted with these. Besides, most of the marginal lands in the open countryside are also devoted to eucalyptus and poplar plantations.

Apart from trees, rough grasses like reeds and kans (Seccharum spontaneam) can be seen in the flood plains and along choe banks in the foothill plain. Valuable grass like bhabhar (Eulaliopsie binata) is also found in these areas. It is used for making ropes, mats and baskets. The grasses also furnish rough pastures for the cattle.

In sum, vegetation cover in the Bist Doab is related with physiography, rainfall and type of soils. More rainy hilly and foothill parts in the east, which have loose and less fertile soils, are marked with denser vegetation. In flat and fertile plain areas of the region, vegetation is sparse. These areas are intensively cultivated. Vegetation in them is mostly planted and is commonly seen along transport and drainage lines.

Soils

Soil is a medium of plant growth. It supports plant life. Plants derive food and water from soil through their root system. Thus, its characteristics are of special significance to agriculture. The soils of the Bist Doab have
been derived from alluvium. Parent material, however, is no indication of the uniformity of soils in different areas of the region. Depending largely upon physiography, rainfall, vegetation and sub-soil water, the soils of the Bist Doab display variations from one part to another. These can be broadly divided into three groups (Map 1.8):

1. Light, exposed sandy soils of the hills and adjoining parts of the foothill plain.
2. Loamy soils of the upland plain
3. Loams and sily loams of the flood plains

1. The hills and adjoining parts of the foothill plain are characterized by coarse soils. These soils contain more of sand than silt and clay. Therefore, these are porous and relatively less fertile. Their lighter nature is the result of soil erosion by the running water. Rainfall in these areas is higher (90 to 100 centimetres). It brings considerable leaching. Thus, these soils are practically devoid of calcium and sulphur, though these are richer in organic matter. They produce good crops under irrigation.

2. The upland plain and those parts of the foothill plain which adjoin the upland plain, are marked with loams and clay loams. These soils are better textured, more retentive of moisture and are fertile. They have developed from old alluvium (bangar) deposited by the rivers under sea. They respond well to irrigation and fertilization. Therefore, these are good for growing a wide variety of crops. The aeolian deposits at places, however, have made them slightly lighter in texture. Dona tract of the Bist Doab is a typical
Soil Types

BIST DOAB

Source: G B Singh (1979), Transformation of Agriculture, Vishal, Kurukshetra
example of this. With a ph value ranging between 7.5 and 8.5, these soils are slightly alkaline. No wonder, these are the best soils of the region and are put to intensive cultivation.

3. The flood plains of the Beas and the Satluj rivers are marked with loams and silt loam soils. These are composed of material brought and spread by the rivers in their flood plains. Therefore, they are most recent in origin and are immature. Due to closer sub-soil water, these soils remain moist. These are very fertile and are especially suitable for the cultivation of rice during summers and wheat during winters.

The People

The Bist Doab is one of the heavily populated parts of Punjab. According to the 1981 census, it is the home of 3,491,703 persons which constitute 20.1 per cent of the total population of the state. Like the country and the state, a large majority (78.0 per cent) of its people dwell in the rural areas and is engaged in agricultural activities (Map 1.11). Its rural population displayed a growth of 46.2 per cent during 1951-81 (Map 1.13).

With an average density of 388 persons and a nutritional density of 490 persons per square kilometre (as against the state average of 331 and 397 respectively), the region is more densely populated than the state (Map 1.9 and 1.10). Agricultural resource base of the region is under intense pressure which is further intensifying with fast growing population. Pressure of population, however, varies areally. A look on the density maps clearly reveals that central parts of the region are more crowded than the peripheral ones. People moved out from more crowded central areas, in fairly large
BIST DOAB

(Data by Tahsils)

Arithmetic Density

Persons per sq km of net area

Nutritional Density

Persons per sq km of net area

Rural Population Density

Rural persons per sq km of cultivated area

Agricultural Workers Density

Agricultural workers per sq km of cultivated area

BIST DOAB
Growth of Rural Population
1951-81
(Data by Tahsils)

Percent Growth

Highest........ 72.9 %
Lowest......... 33.0 %
Mean .......... 46.2 %

Source: Census of India, General Population Tables, Punjab 1951, 1981
number to the peripheral areas where population was relatively sparse and new lands were made available for cultivation particularly after the check on floods in the two rivers.

The region experienced considerable out-migration to other parts of the state, the country and to the foreign lands. The remittance of substantial amounts of money by the emigrants back to their rural relatives played a significant role in the development of agriculture in this region. Emigration and out-migration particularly from the working age groups kept the region behind the state in terms of its workforce. As compared to the state average of 29 per cent, the Bist Doab had 27.3 per cent of its people enumerated as workers in 1981. Agricultural workers (cultivators 31.5 per cent and agricultural labourers 21.8 per cent) constituted more than half of its total workforce (Maps 1.12 and 1.14 to 1.17). The proportion of cultivators is higher in southwestern and southeastern parts and that of the agricultural labourers is higher in the southern Bist Doab. Lower proportion of scheduled castes (who normally work as agricultural labourers) in the southwestern and southeastern areas and their higher proportion in most of the hilly and foothill tract, along with few southern parts of the region, largely explain this fact (Map 1.18).

In brief, the Bist Doab has higher density of population than that of the state. Nearly four-fifth of its people are rural and depend mostly upon agriculture. The region is facing severe pressure of population on its land resource. That is why the size of landholdings in the Bist Doab is smaller. Limited land with the people have forced them to move out for better economic opportunities.
BIST DOAB
Scheduled Caste Population
1981
(Data by Tahsils)

As percentage of total population

Significant Values
Highest.......41.2%
Lowest.......23.0%
Mean..........32.9%

Source: Census of India, General Population Tables and Primary Census Abstract, Part II A & B, Punjab, 1981
The Economy

The economy of the Bist Doab, like that of Punjab, is primarily based on agriculture. This sector provides employment to more than half (53.3 per cent) of its working population. Industrial sector comes next to it and is followed by trade and commerce, and transport respectively.

Agriculture

Agriculture is the major economic activity of the Bist Doab. The region has 79.0 per cent of its total area under net cultivation of which 63.3 per cent receives irrigation. Tube-wells and pumping sets are the major means of irrigation. They irrigate 93 per cent of the net area sown of the Bist Doab. Canals irrigate the rest. Irrigation by canals became important only after the construction of the Bist Doab canal system during early fifties. Agricultural resource base in the region has been stretched to its near limits. Covering 80.1 per cent of the total cropped area, foodgrains dominate its cropland. Wheat and rice are important food and cash crops. They together cover 62.9 per cent of the total cropped area. Maize, fodder, vegetables, wheat-gram, sugarcane, groundnut, and pulses are other important crops grown in the region.

Livestock

According to livestock census of 1956, the Bist Doab had 1,521,712 cattle heads. Their number increased to 1,747,525 in 1977. Buffaloes and cattle (cows, bullocks and bulls) are the chief farm animals. They together accounted for 88.8 per cent of the total livestock in 1977 (as compared to 83.0 per cent in 1956). The number of buffaloes increased significantly
(from 543,997 to 889,092) while that of the cattle declined. This has largely been due to increase in demand for milk, for which the first choice of the farmers rests on buffaloes. Increase in the number of buffaloes is also associated with the decrease in bullocks. Increase in mechanization of farming reduced the need for bullocks as draft animals. Goats and sheep declined from 15.3 per cent in 1956 to 8.9 per cent in 1977. Growing demand for meat largely accounts for their decrease. Their growth has been slower but killings for meat have been greater. Unexpectedly, the proportion of horses, ponies, mules and donkeys increased from 1.8 per cent (24,152) in 1956 to 2.3 per cent (31,292) in 1977. This is attributed to the growth of low class, landless population, to which these animals are largely associated as means of earning livelihood. These beasts of burden are used for short distance transportation of goods and people, particularly in the eastern undulating hilly and foothill parts of the Bist Doab. Pigs are generally raised by landless people. The number of this animal increased from 473 to 10,906 during 1956-77. Poultry farming as a subsidiary activity has become more common especially during last one decade. The region had only 160,677 poultry birds in 1956, which increased to 1,182,474 in 1977. Such an increase indicates the diversification of agriculture. The government played an active role in this process by providing liberal credit facilities to small and marginal farmers, landless workers, and rural artisans. Poultry farming is generally practised around urban centres. Due to the decrease in goats and sheep and corresponding increase in the price of mutton, poultry has become a major source of meat. Of course, poultry birds are the only source of eggs for the market.

Industries

The industrial sector employs 12.0 per cent of the total working
population of the Bist Doab. A dense net of roads, railways, and availability of electric power provide a sound base for the development of industries. Most of the industrial activity in the region is either oriented towards processing agricultural raw materials or for manufacturing agricultural implements and machines. Thus, in the industrial sector, small scale units predominate. This is also explained by the fact that the region is deficient in minerals.

In 1980, the Bist Doab had 1575 registered (working) and 14,638 unregistered factories, which provided employment to 114,865 workers (12.0 per cent of total workforce). Processing of food; production of metals, alloys and metal products; and manufacturing of textiles are the leading industries of the region. Respectively they provide employment to 35.0, 14.6 and 11.7 per cent of the total industrial workforce of the region. Employing 8.0 per cent, 6.2 per cent and 4.5 per cent of the total industrial workers, machinery, machine parts and tool manufacturing; repair services; and manufacturing of transport goods follow in order. Wood and wood products (2.8 per cent); leather and fur (2.7 per cent); rubber and plastic goods (2.4 per cent); paper, paper products and printing material (2.4 per cent); chemicals (1.6 per cent) and non-metallic mineral manufacturing (1.4 per cent) are the other manufacturing activities carried on in the region. The importance of food processing, textile manufacturing, machine and machine parts and manufacturing of tools is ascribed to the availability of agro-raw materials. Flour mills, rice shellers, sugar mills and milk processing centres are important food processing units. Textile manufacturing factories generally deal in cotton textiles and synthetic fibre. Cotton ginning and pressing are important small scale industries of this category. A large number of repair service units (3,720-highest among
all types of industries) has come up to cater to the repair needs of agricultural machinery.

Jalandhar, Hoshiarpur and Phagwara are the three chief industrial centres of the Bist Doab. They specialize in textile manufacturing, food processing and manufacture of wood and wood products, besides having a large number of repair shops and units for making machines and machine parts. Jalandhar is internationally known for its sports goods industry and Hoshiarpur is well known for resin, turpentine, lac and leather products. Phagwara is important for cotton textiles and sugar manufacturing. These three centres are followed by Kapurthala, Nakodar, Nawanshahr, Kartarpur, Banga, Tanda Urmar, Jalandhar Cantonment, Mukerian, Goraya, Phillaur, Garhshankar, Nurmahal, Adampur, Garhdiwala, Sultanpur, Hariana, Rahon, Alawalpur and Sham Churasi in this regard. A new industrial centre has recently emerged at Asron near Balachaur (in Hoshiarpur district) where units for manufacture of machine tools and parts, paper and pulp, chemicals and rubber goods have been established.

Most of the industrial centres of the Bist Doab have come up in the plains, where flat topography has favoured the development of road and rail network and where raw material and labour are also available.

Transport

The Bist Doab is fairly well served with roads and railways. These are the two chief means of transporting goods and people from one place in the region to another. With a road density of 76.5 kilometres per 100 square kilometres of area, as against the state average of 64, the Bist Doab
is more developed than many other parts of Punjab in this regard. Not to talk of urban centres, 97.0 per cent of its rural settlements are linked with metalled roads. Dense net of rural link roads has facilitated the movement of agricultural produce from the farms to the markets and the needed farm inputs from markets to the farms.

The network of roads, however, is comparatively sparse in the eastern parts due to unfavourable physiography and drainage. The central Bist Doab is the most developed area from this angle. Flood plains, where road construction picked up only after control on floods fall in between the two types of areas discussed above.

All major towns of the region are linked to each other by railways. Jalandhar is the biggest railway junction. Besides being connected internally, the Bist Doab is very well linked by roads and railways to other parts of Punjab and neighbouring states of Himachal Pradesh and Haryana. Buses are the chief mode of carrying people from one place to another. Trains are preferred for long journeys. Trucks and tractors are largely employed for the transportation of agricultural produce. However, small and marginal farmers still use traditional bullock cart for the purpose. Transportation of goods for and from distant areas of the country is mostly carried on by rail.

**Trade and commerce**

The Bist Doab is an agricultural region. Its agriculture is semi-commercial in nature. It has considerable surplus of products like wheat,
rice, sugar, potatoes and maize. All these commodities are sent to other parts of the country. Besides, the region accounts for 27.1 per cent (rupees 4393 lakhs) of the Punjab's exports of major industrial items. Machine parts and tools, hand tools, tanned leather, cotton textiles, sports goods, ivory inlaid wooden goods, resin and turpentine, countrymade liquor are the important items of export. Sports goods of the region have an international market. The region spends a lot on the import of agricultural equipment. Being deficient in minerals, it imports metals, petroleum and petroleum products, coal etc. However, all of its trade is regularized by the state government through issuing of licenses to dealers in different commodities.

Identity of the Region

Located in east-central part of Punjab, the Bist Doab covers nearly one-fifth of the total area of the state. Like Punjab, it is roughly triangular in shape. Its predominantly plain topography, fertile soils, favourable temperature conditions the year round, highly developed irrigation system and dense network of roads and railroads provide excellent conditions for agricultural operations. Inadequate, unreliable and seasonally concentrated rainfall, however, is detrimental to agricultural practices. To a great extent, this limitation has been mitigated through the development of irrigation. This apart, hilly and eroded topography with deep and inadequate sub-soil water in parts too hinder agricultural development.

By virtue of its inter-fluvial location, the Bist Doab has its own dialect and displays cultural homogeneity. Almost total dependence
on tube-well irrigation is its distinct feature. Due to intense pressure of population on land, the average size of landholdings is small. Smaller landholdings coupled with tube-well irrigation and greater application of science and technology on the farms encourage comparatively intensive utilization of the available land resource. Higher degree of emigration is a special characteristic of the region which has its own bearing on the development of agriculture. Similar to the state, the industries in this region largely are either agro-based or are geared to meet the agricultural needs. The future of the region lies in the integrated agro-industrial development.