Section-5

BIHAR : AGRICULTURE AND FOREST RESOURCES

Agriculture and Forest Resources:

Bihar is an agricultural state and 80 percent of its population is dependent on agriculture. After its separation from Jharkhand, the importance of agriculture has increased for the people of Bihar. In 1990-91 agriculture was done on 48.88 percent of the total land. This increased to 59.37 percent in 2005-06.

Here four types of crops are grown Bhadai (Autumn), Agahni (Winter), Rabbi (Spring) and Garma (Summer).

Bhadai (Autumn) : It begins from May-June and is harvested in August-September.

Jute and vegetables are also grown apart from paddy, millet, Bajra and maize during this crop season.

Do You Know?

- In Bihar intensive farming is done.
- Agahni (Winter) crop is also known as Kharif crop.

Agahni (Winter) This is the most important crop of Bihar. Winter crop is grown on more than half of the total agricultural land of Bihar. This crop is sown from mid June to August and harvested in November-December. The main crops of this crop season are Paddy, millet, Bajra, Arhar and sugarcane among which Arhar and sugarcane takes one year to mature.

Rabbi (Spring) This crop is sown in the mid of October November and harvested in the month of April. The major crops of this crop season are Wheat, Barley, pulses and oilseeds.

Garma (Summer) : These crops are sown in those areas where proper facility of irrigation is available or in low lying areas where soil remains wet from the local water sources. In this crop season Garma (Summer) paddy and summer vegetables are grown.

The important crops of Bihar are Paddy, Wheat, Maize, Barley, Sugarcane, Tobacco, Mahua, millet, pulses and oilseeds. Apart from these vegetables, fruits and flower cultivation is also done on very large scale. In the Map 5.1 agricultural regions of Bihar has been shown. Agricultural regions depict crops in groups. It is clear from this map that Bihar is basically a food crops producing state.

Food Crops:

Paddy has a very significant place in food crops of Bihar. Autumn, winter and summer, in other words three crops are sown and it is cultivated in all parts of Bihar. In 2006-07 on 33.54 lakh hectare land 50 lakh tonnes of paddy production was registered here.

In North and Eastern parts autumn paddy is cultivated where as all over the state winter paddy is cultivated.

The highest Paddy growing districts are West Champaran, Rohtas and Aurangabad. In these districts more than 18 percent paddy of Bihar is grown. The first position is held by West Champaran where as Rohtas and Aurangabad are placed second and third respectively. From the area point of view, Rohtas is first (5.76 percent).

Wheat:

Wheat is second most important food crop after paddy and it is an important production of Rabbi Crop. In 2006-07 on 20.5 lakh hectare land 43 lakh tonnes of wheat was produced. In the last few years there has been continuous increase in production of wheat and in its area, the main reason for this is after the harvest of paddy crop the fields does not remain as useless fallow land, rather with the help of irrigation and chemical fertilizers it is cultivated. This crop is sown in November-December and harvested in March-April. In 2006-07 Rohtas district was first in the production of wheat, in this district this year 4 lakh metric tonnes of wheat were produced on 136 thousand hectares of land and productivity per hectare was 2965.3 K.G.

Maize:

This is the third most important food crop of Bihar. It is grown in all four crop seasons — autumn, winter, spring, and summer. Through proper arrangement of irrigation and by the use of good variety of seeds its productivity has increased considerably. In 2006-07 its total production was 798:31 thousand metric tonnes. Its production is maximum in Khagaria district where as Samastipur and Begusarai are placed at the second and the third position respectively.

Coarse Crops:

In coarse crops Ragi, millet, Jowar and Bajra are included. It was cultivated on 46.71 thousand hectares of land and its total production was 45.07 thousand metric tonnes. Madhubani district stands first in the production of coarse grains where as second position is held by Kishanganj.

Oil Seeds:

Raye (Tori), Mustard, Linseed, Sunflower, Kusum, Castor, Groundnut are important oilseed crops but for extraction of oil mainly mustard, raye,

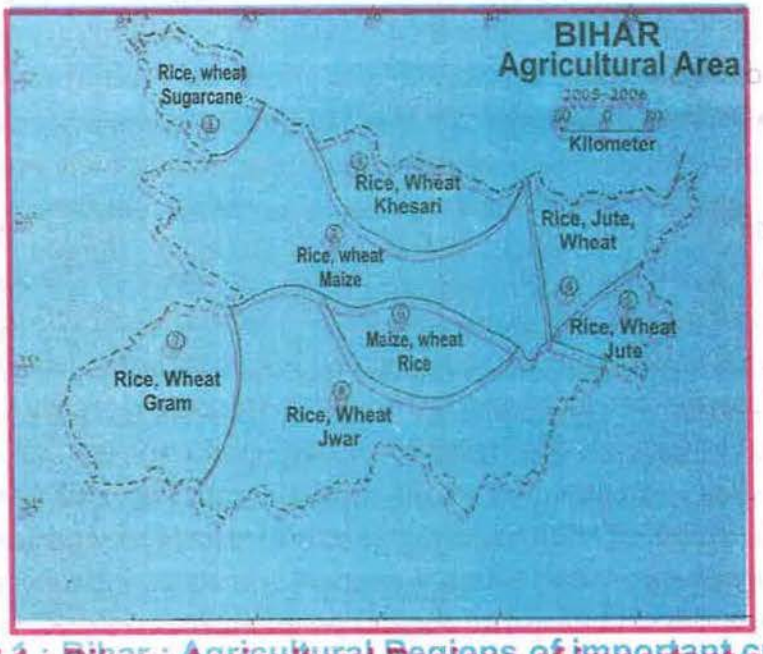

Fig-5.1 : Bihar : Agricultural Regions of important crops.

linseed and sunflower are used. In 2006-07 on 140.60 thousand hectares of land oilseed was cultivated and the total production was 149 thousand metric tonnes. West Champaran is a leading producer of oilseeds followed by Begusarai, Purnia and Saharsa.

Do You Know?
There are two crops of oilseeds, one is Rabbi in which Ragi (Tori), Mustard, Linseed, Sunflower, Kusum and Castor and the second is Kharif in which Sesame, Sunflower and Groundnut is

Pulses: The important pulse crops of Bihar are Gram, Masur (Lentil), Khesari (Lethayrus), Peas, Moong (Green Gram), Arhar (Pigeon Peas), Urad and Kurthi (Horse Gram). Among that Gram, Masur (Lentil), Khesari, Peas and summer Moong (Green Gram) are Rabbi pulse crops, whereas Arhar (Pigeon Peas) and Moong (Green Gram) are Kharif pulse crops. In 2006-07 on 519.6 thousand hectares of land 372 thousand metric tonnes of Rabbi Pulse crop was produced. Similarly, on 87.26 thousand hectares of land 74 thousand metric tonnes of Kharif Pulse crop was produced. Patna is the leading district in the production of Pulses, whereas Aurangabad and Kaimur districts stand second and third respectively.

Commercial Crops:

Sugarcane: We have all the favourable Geographical conditions available for the cultivation of sugarcane in our state but still the per hectare yield of sugarcane in Bihar is very less. It is mainly cultivated in the North-Western parts of the state. The Doab of Gandak, Baghmati, Kamla and Ghaghra rivers is its main producing area. In 2006-07 on 117 thousand hectares of land sugarcane was cultivated and 5338 thousand metric tonnes of sugarcane was produced. In the last few years there has been increase in the production of sugarcane, as there is marked increase in area and production of sugarcane in 2006-07 in comparison to 2005-06. In 2005-06, the sugarcane was cultivated on 101 thousand hectares of land and the total production was 42.40 thousand metric tonnes. West Champaran is first in the production of sugarcane whereas second and third positions are held by Gopalganj and East Champaran districts respectively.

Jute: Jute is cultivated in the North-Eastern districts of Bihar due to fact that this area receives plenty of rainfall which is ideal for Jute cultivation. Bihar produces eight percent of the total production of the Jute in the country and stands third after West Bengal and Assam. In 2006-07 on 1.45 lakh hectares of land 14 lakh bales of Jute was produced but now there has been rapid decline in its production. Jute is mainly grown in Punea, Katihar, Madhepura, Kishanganj, Saharsa, Madhubani, Darbhanga and Samastipur districts.

Tobacco: Bihar stands sixth in the production of Tobacco in India. The 'Diara' land of the river Ganga is suitable for its cultivation. The districts of Samastipur and Vaishali are famous for Tobacco cultivation. Apart from this it is also cultivated in Darbhanga, Patna, Bhagalpur, Munger and Muzaffarpur districts. In these districts on 140 thousand hectares of land 16140 thousand metric tonnes of Tobacco is produced.

Vegetables, Spices and Fruits: The important vegetables cultivated in Bihar are Potato, Onion, Bhindi (Ladies finger), Paror (Spounge gourd), Lauki (Bottle gourd), Spinach, Lal Saag (Emaranthus), Lobia (Cow pea), Cauliflower, Patal (Pointed gourd), Cabbage etc. Among these vegetables, Potato is not only the most important vegetable but also a very important part of our food. It is cultivated in almost all the districts of Bihar. In some districts two crops of Potato is grown. In Bihar the total production of potato is 5, 66,000 metric tonnes and it is cultivated on 1, 68, 000 hectares of land. Patna and Nalanda districts are the leading producers of potato.

Onion is mainly cultivated in Patna and Nalanda districts. Onion is cultivated on large scale in Nawada, Gaya and Jehanabad also. The total production of Onion here is 3, 55, 000 metric tonnes. Other vegetables are grown on a very large scale in 'Diara" region of Ganga, Gandak and Baghmati. A variety of vegetables are grown on a very large land area in Patna and its surrounding areas.

Chilli: Chilli is cultivated on a very large scale in 'Diara' region on both banks of river Ganga. Other spices grown in Bihar are Turmeric, Ginger, Coriander, fennel seeds and Garlic.

Mangoes, Lichi, Guava, Banana, Papaya, Singhara (Water Chest nut), Makhana (Gorgon nut) are some seasonal fruits which are grown in Bihar. Bhagalpur, Muzaffarpur, Purnea, Darbhanga districts are famous for Mangoes. Muzaffarpur and Vaishali are famous for Litchi. Banana orchards in large scale have been developed in Vaishali, Khagaria, Begusarai, Samastipur districts. Madhubani and Darbhanga districts are famous for Makhana (Gorgon nut). In the 'Diara' region of river Ganga Cucumber, Kakri and water melon are cultivated.

Problems of Agriculture:

90 percent of the total population of Bihar lives in villages and 80 percent of its population is dependent on agriculture but still the per hectare yield is less in comparison to other states. This state is struggling with several problems associated with its agriculture.

(i) **Soil Erosion and Loss of Soil Quality:** Due to heavy rainfall and floods soil is eroded. **Besides,** due to continuous use of chemical fertilizers there is deterioration in the quality of soil.

(ii) **Use of Inferior Quality Seeds:** As high quality seeds are not used, therefore the per hectare yield is very less in comparison to other states.

(iii) **Small size of the Agricultural Fields:** In our state the agricultural fields are of very small size as a result of which in agricultural activities application of scientific method is not possible.

Do You Know?

- The Geographical area of Bihar is 93.6 lakh hectares out of which 64 lakh hectares are flood prone.
- Out of the total Geographical area of Bihar only 59.36 percent is sown area and more than 40 percent of the agricultural area remains unused.
- In Bihar 9.41 lakh hectares of land is prone to water logging, in which 8.35 lakh hectares of land is in North Bihar and rest 1.06 lakh hectares of land is in Mokama Tal.
- Bihar is the third largest vegetable producing state of the country.
- Bihar is the largest Guava and Litchi producing state of the country.

(iv) **Orthodox opinion of the Farmers:** The farmers here believe less in hard work and more on luck and orthodox views.

(v) **Irrigation problems:** The agriculture here is dependent on Monsoon which is also prone to frequent flood and drought but still there is no proper arrangement of irrigation. Out of the total agricultural land only 46 percent is having irrigational facilities and the rest remains without proper irrigation facility.

(vi) **Floods:** Most of the rivers of the state are famous for their devastating floods. These rivers coming down from Himalayas carry huge amount of silt with them and deposit it on their bed which causes the change in its normal course as a result of which disastrous flood occurs which causes heavy loss to life and property. According to planning commission, 64 lakh hectares of land is prone to floods in Bihar. New land emerges due to change of course of the rivers in the flood prone areas. Over the ownership of these lands there is atmosphere of terror in the 'Diara' region due to criminals and Naxals. This year (2006), in the month of October there was unprecedented killing of people due to similar type of land dispute in Khagaria district.

Apart from these problems, scarcity of capital, deplorable conditions of animals, population, economic and social problems also create hindrances in the development of agriculture.

Agricultural Calendar:

The agricultural fields are ploughed after heavy rainfall in mid june. In July Kharif crop is sown. In August paddy plants are transplanted and in September Kharif crop is ready for harvest. In September the fields are prepared for Rabbi crop, in January weeding of rabbi crop is done and in March-April it is harvested; after this people engage themselves in the cultivation of sugarcane.

Water Resources:

There is huge reservoir of water in Bihar, which we get from two main sources :

(i) **Surface water :** This includes rivers, reservoirs and ponds.

(ii) **Underground water :** This includes wells, waterfalls, tube wells, hand pumps etc.

In Bihar the water resources are mainly used in irrigation, at homes and in industrial institutions. But at present more than 95 percent of total water resource is utilised in irrigation. The duration of rainfall through Monsoon is of only four months. Apart from this irregular and uneven rainfall is also received. Here some crops are grown in winter season and this season remains dry, but at the time of sugarcane, potato, Onion etc. cultivation irrigation is required. Irrigation is required to increase productivity of the food grains for the ever increasing population. The important means of irrigation in Bihar are canal, wells, tube wells, ponds, Aahar, Pyne.

Canal:

Canal is the most important means of irrigation in Bihar. Here 40.63 percent of the total irrigated land is irrigated through canal. In plains canals

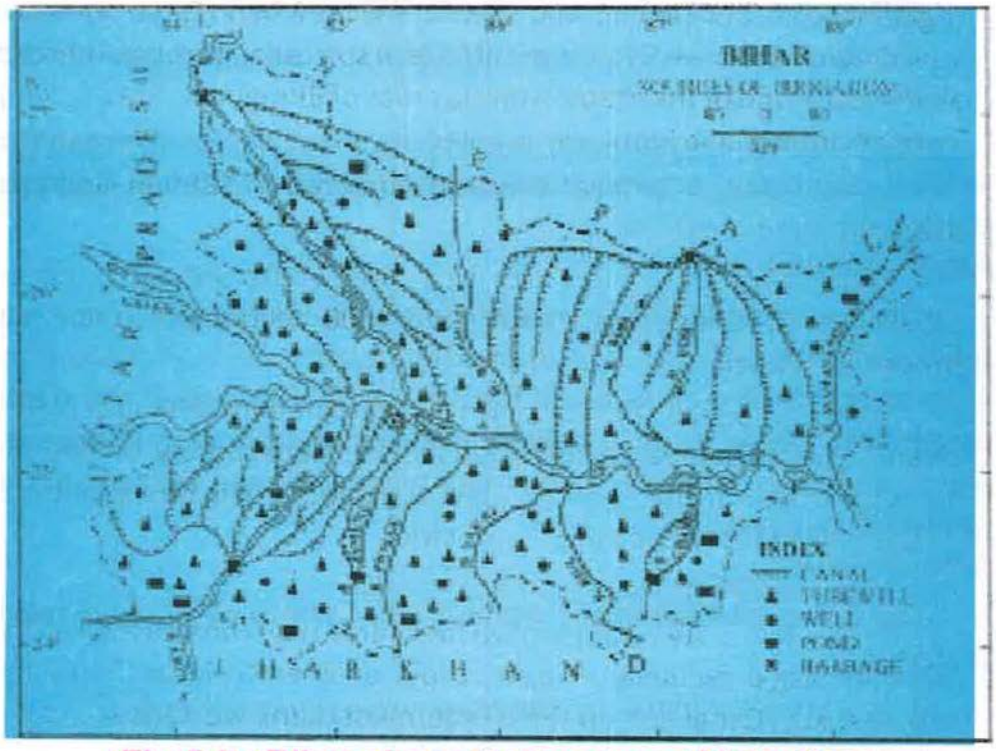

Fig-5.2 : Bihar : Important means of irrigation

are more developed, because the land is even, soil is soft, extended agricultural area and water is supplied through perennial rivers. Most of the rivers of North Bihar come out from the Himalayas and so they are perennial. Water remains in these canals throughout the year, on the contrary canals in the south Ganga plain depend on the rivers which come out from chotanagpur plateau which are seasonal and rain fed and that is why water does not remain in these canals throughout the year. In this part, Dams have been constructed on the rivers to collect water. The water is released from these Dams in to canals so that water may reach agricultural fields as per requirement.

In Bihar the development of few canals took place in the pre - independence period and few were developed in post - independence period.

Canals of Pre - Independence Period:

Son Canal - It is a part of son irrigation project. It is the first modern irrigation project of Bihar. It was constructed in 1874 on Dehri and two canals were drawn from it — Eastern and Western son canal; through these canals 4 lakh hectare land of the drought prone areas of Bhojpur, Rohtas, Aurangabad, Gaya, Jehanabad and Patna are irrigated.

Saran Canal - This canal was constructed in 1880 in Gopalganj sub division.

Dhaka Canal : It is a small canal in Dhaka sub division on river Lalbakia. Its total length is 30 K.M. and 4500 hectares of land is irrigated through this canal.

Triveni Canal : This canal was constructed in 1903 at a place called Triveni in West Champaran district on India — Nepal border on river Gandak. The total length of this canal is 1.094 K.M. and it irrigates about 1.25 lakh hectares of land in west champaran district.

Canals of Post - Independence Period:

Kosi Canal : Two canals have been drawn by constructing a Dam near Hanuman Nagar on India —Nepal border on river Kosi. On the Eastern Kosi bank East Kosi Canal and on the Western Kosi bank western Kosi canal have been constructed.

The total length of Eastern Kosi canal is 44 K.M. and there are four branches of this main Kosi canal— Murli ganj canal, Janki Canal, Purnea canal and Araria canal. Thus, the total length of this canal with its branches and sub-branches put together is 3040 K.M. About 6 lakh hectares of land in Purnea, Saharsa, and Madhepura districts is irrigated through this canal.

The total length of western Kosi canal is 115 K.M. About 3 lakh hectares of land in Darbhanga district is irrigated through this canal.

Gandak Canal : A 760 meter high and 743 K.M. long Barrage has been constructed near Valmiki Nagar 85 K.M.south of Triveni on river Gandak. From this barrage Tirhut canal that runs towards west and Saran canal that runs towards East has been drawn. From Tirhut canal about 4.8 lakh hectares of land in Saran district is irrigated and from Saran canal 6.9 lakh hectares of land is irrigated in Champaran, Muzaffarpur and Darbhanga districts.

Tube Well : After canal irrigation, tube well is the second most important means of irrigation. Tube wells were not a popular source of irrigation in Bihar before independence but after independence rapid development of tube wells took place and now 38.77 percent of the total irrigated land is irrigated through tube wells. Tube wells are popular means of irrigation in Samastipur and Sitamarhi.

Wells : Wells have remained very popular in Bihar since ancient times, but at present it has lost its significance. Now it has been replaced by pump sets and irrigation through wells has come down to 2 percent only. In some plain areas the percentage of well irrigation is still higher, among these Darbhanga, Madhubani and West Champaran districts are important. Utilisation of wells as means of irrigation is more in the southern plains of in comparison to northern plain. In this Nawada, Nalanda, Gaya and Jehanabad districts are important. The construction of wells is very convenient in these districts because the water level is high here.

Tanks or Ponds : Utilisation of tanks or ponds for irrigation and other works has been a very old tradition. In any village or city where there is no

river, all the religious rituals are performed on the bank of tanks. All the worship rituals and religious traditions of very sacred festival of Bihar 'Chhath' are performed on the bank of ponds. Facility of two types of ponds are available in flood prone areas of Bihar, whereas facilities of manmade tanks are more in plain areas. Digging of tanks is easy here due to soft nature of soil . Fishery and Makhana cultivation is done here in the tanks.

Do You Know?

'Chhath' is mainly a regional festival of Bihar and eastern Uttar Pradesh. It is a very sacred festival and now it is celebrated in several parts of India. It is celebrated twice in a year one is 'Shardiye' and other is called 'Chaiti Chhath', which are celebrated in 'Kartik Shasthi' and 'Chait Shasthi' respectively. In this festival 'Ardhya' is devoted to 'Bhagwan Bhashkar' (the sun).

In India 9 percent of the total cultivable land is irrigated through tanks or ponds but in Bihar the total share of tank irrigated land has come down to only 2.10 percent. Madhubani district stands first in tank irrigation where 17 thousand hectares of land is irrigated through this means of irrigation, the second position is held by Nalanda, where more than 12 thousand hectares of land is irrigated through tanks.

Other Sources:

Pyne, Ahar, Lakes, Ponds, Artificial Lakes, Dheku and Mot etc. are the other sources of irrigation in which Pyne and Ahar are important. Pyne is used in such areas where there is scarcity of water in which Rohtas, Gaya, Jehanabad, Nawada, Nalanda, Patna are important districts.

River Valley Projects:

For the utilisation of huge water resources and looking at the devastating floods, extremes of droughts, development of multipurpose river valley projects has taken place in Bihar through which production of hydro-electricity, irrigation facility, fishery, drinking water facility, industrial use, entertainment and communication could be developed. To achieve

these objectives several projects have been made in which three are most important ones

1. Son River Valley Project
2. Gandak River Valley Project
3. Kosi River Valley Project

Other Projects Are

1. Durgawati Reservoir Project
2. Chandan Bahua Project
3. Baghmati Project
4. Barnaar Reservoir Project

1. Son River Valley Project:

This project is the oldest and the first river valley project of Bihar. It was developed by English in 1874 for irrigation purposes. Through this two canals have been drawn that runs towards east and west from Dehri. Its total length was 130 K.M. From this canal several branches and sub-branches of canals was developed in Patna and Gaya districts, through which Aurangabad, Bhojpur, Buxar, Rohtas districts get irrigational facilities and now in total 4.5 lakh hectares of land is irrigated. Through this project irrigation facility was made available to drought prone areas which resulted in to considerable increase in the per hectare yield of south-west region of Bihar and rice cultivation also increased immensely. This is the reason why this region is called "Rice Bowl of Bihar".

For the production of hydro-electricity from this multipurpose project power stations have been established, on the west canal near Dehri a power atstion of 6.6 MW capacity has been established. Similarly, on the eastern canal at Baarun a 3.3 MW capacity power station has been built. There is a plan for the renovation of this project. Construction of Dam near Indrapuri on river son has also been proposed with a target of generating 450 MW of hydro-electricity.

2. Gandak River Valley Project:

It is a joint project of Uttar Pradesh and Bihar which has been started near Valmiki Nagar in collaboration with India and Nepal. Through this project electricity and water for irrigation is supplied to Nepal also. For the

construction of this project a 743 meter long barrage has been constructed across river Gandak near a place called Bhainsalotan and Valmiki reservoir has been created. Two major canals have been drawn from this reservoir, the western main canal and eastern main canal. Through this canal system about 4 lakh hectares of land in three western districts of Bihar, Gopalganj, Saran and Siwan is irrigated. In the eastern part of Valmikinagar eastern main canal has been drawn, it is also known as Tirhut canal and it runs parallel to river Gandak. It has several sub - branches, through these canals about 4-5 lakh hectares of land in west champaran, east champaran, Muzaffarpur, Vaishali and Samastipur districts are irrigated.

Through this project, east of Valmikinagar a hydro-electric generation station has been established on a water fall. Electricity produced here is supplied to Nepal.

3. Kosi River Valley Project:

This project was contemplated in 1896 but work could start on this project in 1955.

This project is an outcome of the joint effort of Government of Nepal, Government of India and state of Bihar. The main objective of this project is to check the shifting trend of course of this river, to control the destruction of fertile land, to stop destruction through devastating floods, development of irrigational facilities, generation of hydro-electricity, development of fishery, boating and control on environment. This project has been completed in many phases. The first phase includes control on shifting course of the river, construction of a barrage at Hanuman Nagar on Bihar-Nepal border, construction of embankments on both sides for flood control, construction of eastern and western Kosi canal and its branches. In addition to this 240 kilometer long embankment has been constructed on both sides of the river for flood control.

Plan was made to irrigate about 14 lakh acres of land through the eastern canal and its four major branches. Through this, irrigation facility could have been provided to Purnea, Saharsa, Madhepura and Araria districts. The Eastern canal has further been extended and its one branch Tajpur canal has been drawn. Several sub-branches have been drawn from the western canal, about 35 kilometer area of western canal lies in Nepal and the rest area lies in Madhubani and Darbhanga districts. Kosi barrage is 12, 161.30 meters long which was completed in 1963.

In second phase of this project when work related to electricity generation was completed and a power station of 20, 000 Kilowatt capacity on eastern Kosi canal is under construction.

Durgawati Reservoir Project The main objective of this project is to irrigate drought prone areas of Kaimur and Rohtas districts and flood control. A dam was constructed near Kudra on Durgawati river in 1962 with an objective to irrigate 17, 325 hectares of land but desired result could not be achieved, so on the same river near Karmchat in Chenari block, there is a plan to construct a 45.72 meter high Dam through which 36,000 thousand hectares of land can be irrigated.

Upper Kiul Reservoir Project It is a multipurpose project, which has been constructed on the upper parts of Kuil river. There is a plan to irrigate 14, 000 hectares of land in Munger and Lakhisarai district through this project. The main objectives of this project are irrigation, flood control and enrichment of environment.

Baghmati Project This project is situated in Sitamarhi district on river Baghmati, in the lower portion of the river near Ramnagar a Dam has been built. It is also a multipurpose project. The main objectives of this project are irrigation, flood control, to stop river erosion, water outlet and enrichment of environment. Through this 1, 19, 800 hectares of land in East champaran, Sitamarhi, Sheohar, Muzaffarpur districts are irrigated.

Barnaar Reservoir Project Through this project by constructing a pucca Dam on river Barnaar, in the drought prone areas of Jamui district 22, 400 hectare of land can be irrigated.

Forest Resources:

After the division of Bihar most of the forested areas are now a part of Jharkhand. At present, in Bihar forest cover can be found in only 76.87 ***(Please check this data from the writer)*** percent geographical area and average per capita forest land is only 0.05 hectares which is much below the national average of 0.53 hectares.

The Forests of Bihar can be Classified in to Two Categories

(i) Moist Deciduous Forest and (ii) Dry Deciduous Forest

(i) Moist Deciduous Forest This type of forest is found in the southern hilly region and north-western parts. Extension of this type of forest is found in 917 square kilometer area in Someshwar-Doon (Shiwalik Region). Sal and Shisham trees are prominent in this type of forest, apart from these Bamboos, Sawai grass, Mahua, Jamun, Karanj etc. trees are also found.

Do You Know?

- There are 6374 square K.M. notified forested area in Bihar.
- Very dense forest is found in only 76 square K.M. area.
- About 50 percent of the notified area is either deserted or extinct.

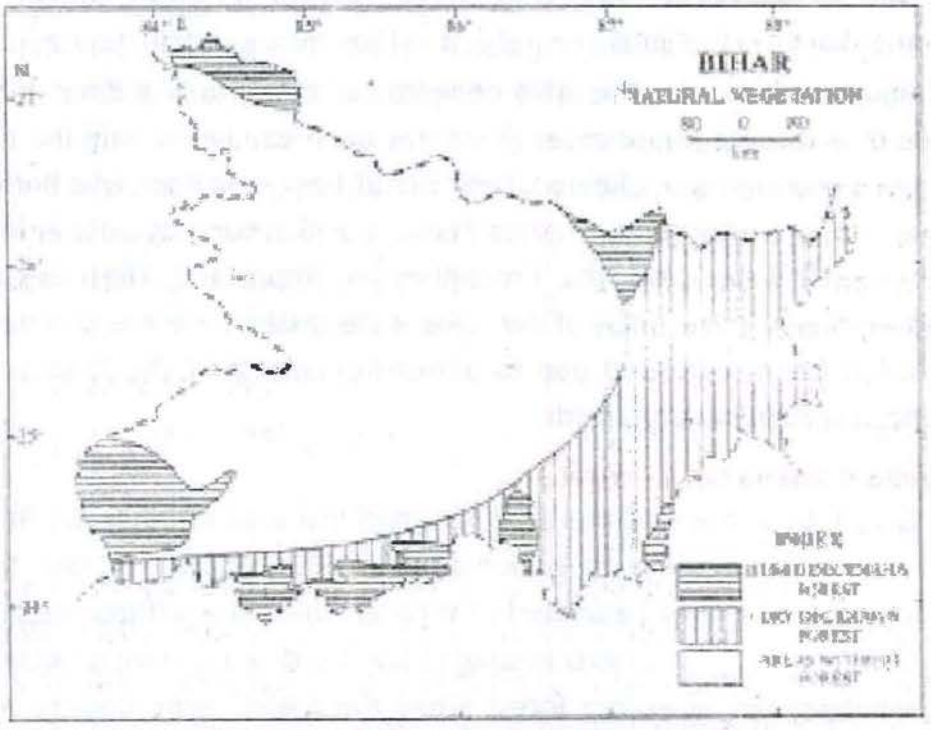

Fig- 5.3 : Bihar : Natural Vegetation

(ii) Dry Deciduous Forest In the east central parts and south west hilly parts of Bihar extension of this type of forest is found. Extension of this type of forest is found in Kaimur and Rohtas districts. The important trees of these forest are Khair, Bahera, Palash, Mahua, Amaltas, Shisham, Neem, Harre etc.

Do You Know?

The moist deciduous forest and dry deciduous forest are divided by 125 centimeter isohyets.

The distribution of forest in Bihar is very uneven. The plains and Diara area are completely devoid of natural forests. In Siwan, Saran, Bhojpur, Buxar, Patna, Gopalganj, Vaishali, Muzaffarpur, Motihari, Darbhanga, Madhubani, Samastipur, Begusarai, Madhepura, Khagaria, Nalanda districts forest is found on less than one percent of land. Extension of forests is found in hilly areas of West champaran, Kaimur, Banka, Jamui, Gaya and Munger districts.

Due to agriculture and extension of constructed areas, forests are being destroyed. Lack of awakening about the significance of the forests is the most important factor for the rapid depletion of the forests in Bihar. In the absence of adequate forest cover there has been decline in wild life also. Among wild animals Tiger, Cheetah, Deer, Chital, Bear, wild Boar, wild Buffalo, Sambhar etc. are important, in birds Peacock and among aquatic animals Alligator, Fresh water Dolphins, Crocodiles are important. These aquatic animals are found in the rivers of the state. A steep decline in the number of wild life has been registered due to unmindful cutting of the forests and poaching of wild animals and birds.

Forest and Wild Life Conservation:

Only 6.87 percent of the total Geographical area of Bihar has forest cover, whereas according to national policy, 33 percent of the total Geographical area should be under forest cover. Therefore, efforts are being made to emphasise control over cutting of forests, development of national parks, rehabilitation of extinct forest areas along with farm forestry. As a result of these efforts, the area of rehabilitated extinct forests has increasedto 15237 hectares in 2006-07 from 2849 hectares in 2004-05.

The plantation of forest has also increased considerably. Here in 2005-07 more than 2 crore plants were planted. A very important step in the direction of farm forestry has been taken by government of Bihar, under Rashtriye Sum Vikas Yojna (RSVY) community based forest management and conservation plan has been started. From farm forestry not only state income will increase but also base for raw materials for the establishment of wood based industry will also be available. These days popularity of social forestry and commercial forestry is increasing.

For the conservation of forests and wild life in Bihar, there are many rituals and customs prevalent since ancient times. There are many religious rituals that are performed under the trees. There are many regional festivals which are associated with trees. Traditionally, Vat, Pipal, Anwala and Tulsi plants and trees are worshiped in this state. In our state food is given to Ants and poisonous creatures like snakes are worshiped. Tradition of giving grains to the birds is also popular. Also several programmes are in operation at national and state levels for the conservation of wild life. There are 14 sanctuaries and one National park in our state which cover an area of 2064.41 hectares of land. In this Sanjay Gandhi Botanical Garden at Patna, Kanwar lake which is spread over an area of 2500 acres in Manjhaul sub-division of Begusarai district, Kusheshwar Asthan in Darbhanga district are famous for wild life conservation.

Do You Know?

Sanjay Gandhi Botanical Garden, Patna is spread over in an area of 980 acres and is the only national park of Bihar.

Kanwar lake is an important nesting ground for the migratory birds. Famous ornithologist Dr. Salim Ali called this place as "heaven of Birds".

It is possible to study 300 species of birds at a time in Kawar lake.

Previously migratory birds were trapped in large scale at Kusheshwar Asthan but due to awakening of people, hunting in any form is totally prohibited here.

There are many institutions of state government which are working for the conservation of forest and wild life. Among them Forest, Environment and Water resource department are important. Apart from these there are number of self help institutions (NGOs) which are also working in this field. Among them Prayas, Taru Mitra, Pratyush and Mandar Nature Club of Bhagalpur are important.

QUESTIONS

OBJECTIVE TYPE QUESTIONS

1. In how many percent of area is agriculture done in Bihar?
   (a) 50 (b) 60
   (b) 80 (d) 36.5

2. What percent of population of the state is engaged in agriculture?
   (a) 80 (b) 75
   (c) 65 (d) 86

3. Which out them is not a sugarcane producing district?
   (a) Darbhanga (b) West Champaran
   (c) Muzaffarpur (d) Rohtas

4. Jute production in Bihar is —
   (a) Increasing (b) Decreasing
   (b) Stable (d) None of these

5. A Tobacco producing region is —
   (a) Northern plain of Ganga (b) Southern plain of Ganga
   (c) Tarai Region of Himalayas (d) Diara of Ganga

6. Kosi river valley project started -
   (a) In 1950 (b) In 1948
   (c) In 1952 (d) In 1954

7. At which place was Gandak project constructed?
   (a) Bettiah (b) Valmikinagar
   (c) Motihari (d) Chapra

8. Which is the most canal irrigated district of Bihar?
   (a) Rohtas (b) Siwan
   (a) Gaya (d) West Champaran

9. In how many notified area of Bihar is extension of forest found?
   (a) 6374 K.M. (b) 6370 K.M.
   (c) 6380 K.M. (d) 6350 K.M.

10. Kusheshwar Asthan is situated in which district?
   (a) In Vaishali (b) In Darbhanga
   (c) In Begusarai (d) In Bhagalpur

11. Kanwar lake is situated -
   (a) In Darbhanga district (b) In Bhagalpur district
   (c) In Begusarai district (d) In Muzaffarpur district

12. In which city is Sanjay Gandhi Botanical Garden situated?
   (a) Rajgir (b) Bodh Gaya
   (c) Biharsharif (d) Patna

SHORT ANSWER TYPE QUESTIONS:

13. Mention the favorable Geographical condition for Rice cultivation in Bihar.
14. Present a brief description of pulse production and distribution in Bihar.
15. "Agriculture is the backbone of Bihar's economy". Elucidate the statement.
16. Write the main objectives of river valley projects.
17. Write the problems associated with the development of canals in Bihar.
18. In which part of Bihar is irrigation required and why?
19. Write four reasons for the scarcity of forest in Bihar.

20. Discuss briefly the dry deciduous forest.

21. Write the names of those districts of Bihar where extension of forest is less than one percent.

22. Write the total number of National Parks and sanctuaries situated in Bihar and discuss the two sanctuaries.

LONG ANSWER TYPE QUESTIONS:

15. Describe in detail the agricultural problems of Bihar.

16. Which crops are sown in Bihar? Explain the important production of any one crop?

17. Name important river valley projects of Bihar and describe the significance of Son or Kosi projects.

18. Describe in detail about the wild life conservation in Bihar.

ACTIVITY:

- Prepare a list of canals in Bihar and mark that from which river they have been drawn.
- Write any local song or story related to conservation of forest and wild life.

MINERALS AND ENERGY RESOURCES

The availability of mineral wealth is an index of economic development of a region. After the separation of Bihar, the mineral rich areas went to Jharkhand and Bihar became almost devoid of any mineral wealth. Now it has less than one percent of the total reserves of mineral resources of the country. Limestone and Pyrites are only two such minerals which is available in sufficient quantity here; apart from these small deposits of Bauxite, Quartzite, Feldspar, Magnetite etc. are found. In 2005-06, the total revenue earnings of Bihar from mineral wealth was 96.38 crores of rupees. The minerals of Bihar can be classified in to following categories.

(i) Metallic Minerals: It includes Bauxite, Magnetite and Gold ore. The total Bauxite reserve in Bihar is 1.5 thousand metric tonnes and is found in Gaya, Jamui and Banka districts. The total reserve of Magnetite stone is 0.59 thousand metric tonnes and is found in the hilly regions of Bihar. Gold ore is found in very less quantity as sand deposits in south Bihar Rivers in which total amount of gold metal extracted from its ore is 0.1 to 0.6 gram per tonnes. The total gold reserve in Bihar is 128.88 metric tonnes and gold is not commercially produced in Bihar.

Do You Know?

Muscovite is a very high quality Mica and it is also known as Bengal Ruby. It is of red copper color and its layers are very thick, 15 to 30 centimeters long and 8-10 centimeters in width.

There are three main varieties of Mica, Muscovite, phlogopite, Biotite.

(ii) Non Metallic Minerals: Non metallic minerals like limestone, mica, dolomite, silica sand, pyrite, quartz, feldspar, china clay, slate and *shora* are also found here. The total limestone reserve in Bihar is 210.85 thousand metric tonnes and it is mainly found in Kaimur and Rohtas. Its annual production is 260 lakh tones and is mainly used as raw material for cement industries. It has some domestic use also.

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The total mica reserve is 60.35 thousand metric tonnes and is found in the areas adjacent to Jharkhand. Its reserves are found in Nawada, Jamui and Banka districts. Muscovite mica is found in Bihar.

Dolomite reserves are found in Kaimur and Rohtas districts and its total reserve in Bihar is 180 thousand metric tonnes. Silica sand is mainly found in Munger district and its total reserve is 5.25 thousand metric tonnes Pyrite. Amjhor hills of Rohtas is famous for this. The other centre is Kaimur district. The total pyrite reserve in Bihar is 98.79 thousand metric tonnes and now it is most important mineral of Bihar.

Do You Know?

- From the Pyrites of Amjhor hills (Rohtas) 40 percent sulphur is found.
- For fertilizer industry of Sindri Pyrites are transported from the mines of Rohtas and Kaimur.
- The Pyrite deposit in Amjhor hills is found in 125 kilometer area.

Quartz mines are found in Gaya, Nawada, Munger and Banka districts. It is one of the precious stones. Its total reserve in Bihar is 10.83 thousand metric tonnes. Some amount of Feldspar is also available in Bihar (About 5 thousand metric tonnes); it is also a precious stone found mainly in southern districts. The reserves of China clay is in Bhagalpur, Munger and Banka districts, its total production is 1.2 lakh metric tonnes. The probable reserve of slate is in Lakhisarai, Munger and Banka districts and its total reserve is more than 4 lakh cubic meters. *Shora* is found in sufficient amount in Saran, East Champaran, West Champaran, Muzaffarpur, Patna, Nalanda, Jehanabad and Aurangabad districts.

Atomic Minerals : Graphite, which is also known as Black lead or Plumbgo is mainly used in refractory industries. It is found in Munger and Rohtas districts.

Fuel Minerals : There is possibilities of occurrence of mineral oil in Ganga basin (Bihar). Efforts are being made by Oil and Natural Gas Corporation (ONGC) with the support of Keners multinational company in this direction. Investigation work is in operation in Darbhanga and Champaran regions.

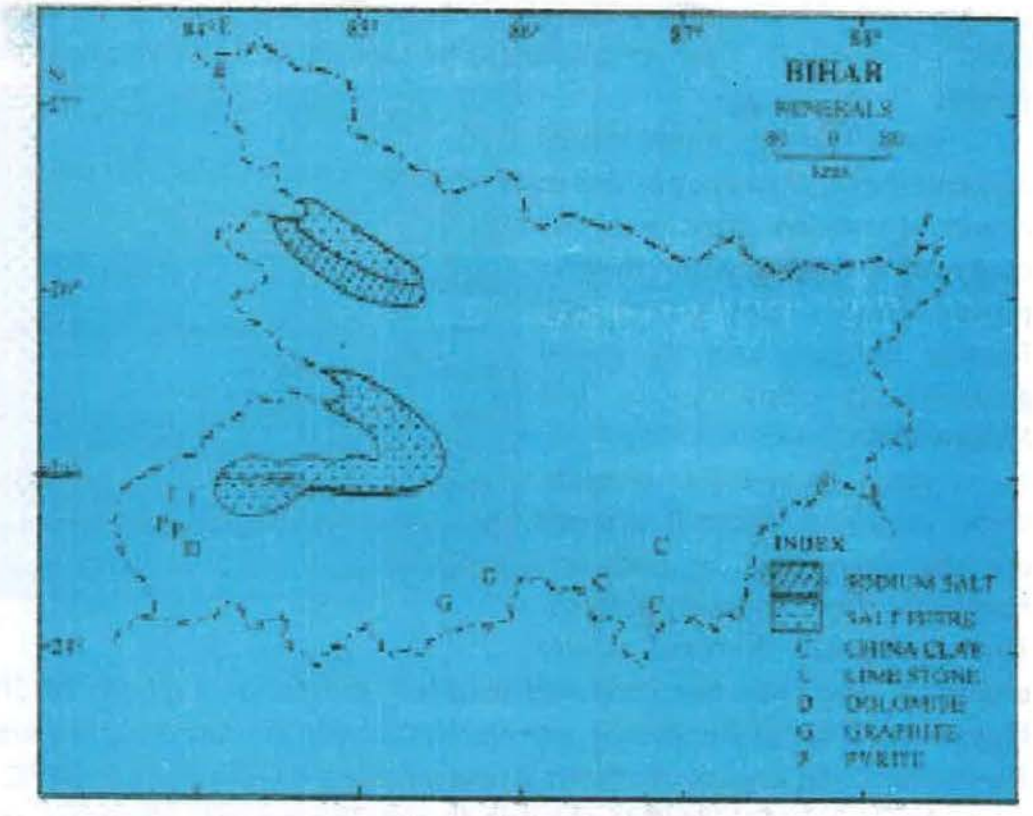


Fig- 5.4 Bihar : Minerals

Apart from these minerals, there are sufficient reserves of Granite, superior quality sand and clay soil etc. Granite reserves are found in Gaya, Jehanabad, Arwal, Munger, Jamui. Nawada, Bhagalpur and Banka districts.

Sources of Energy:

Bihar is not developed in any source of energy. In this regard we are more dependent on others. There are some developed units but they are thermal power centres in conventional sources of energy.

Conventional Sources of Energy:

In the conventional sources of energy there are many thermal power stations in Bihar. Among these Kahalgaon, Kanti and Barauni thermal power stations are important. The generation capacity of Kahalgaon super thermal power station is 840 Megawatts; this power station is sponsored by the Government of India and works under National Thermal Power Corporation (NTPC). It has been planned to increase its capacity to 1500 Megawatts in future.

Kanti thermal power station is situated near Muzaffarpur and its power generation capacity is 120 Megawatts. The Barauni thermal power project was setup with Russian support and its power generation capacity is 145 Megawatts.

Do You Know?

Kahalgaon super thermal power station is the largest thermal power Project of Bihar. It was established in 1979.

Barauni thermal power project was established in 1970.

The coal for Kahalgaon and Kanti comes from the mines of Jharkhand, where as raw materials and diesel for Barauni comes from Barauni oil refinery.

Apart from these projects, some proposed thermal projects are also there such as Barh and Nabinagar thermal power projects. The proposed thermal power project at Barh has the proposed installed generation capacity of 200 Megawatts. After its completion, the electricity crisis of south Bihar will end. The construction work of this thermal power project is being done by NTPC. It is situated in Barh sub-division of Patna district. The progress of work is very rapid.

The construction of Nabinagar thermal power project is a joint venture of railways and NTPC. The proposed installed power generation capacity of this power station is 1000 Megawatts and it is situated in Aurangabad district.

Hydro Electricity:

There is rapid progress in Bihar on the hydro-electric projects. Bihar State Hydroelectric Power Corporation (BHPC) was constituted in 1982 for its development. Through this, a target has been set to generate 2055 Megawatts of electricity.

Situated at Dehri (Rohtas district) west son project, Varun (Aurangabad district) Eastern son link canal, Valmikinagar (West Champaran) and Kataiya project (All these four projects operate under BHPC), through which only 44.10 Megawatts of hydro-electricity is produced. And in order of production they are 6.60, 3.30, 15.00 and 1.20 Megawatts respectively.

In Kaimur and Aurangabad districts work is in progress on many proposed hydro-electric projects under BHPC, apart from these there are six under construction hydro-electric projects Kaler (Arwal), Agnur Bagha (W. Champaran), Obra (Aurangabad), Delbag of Tejpur Dehri (Rohtas), Nasriganj (Rohtas), Jainagar of Nokha (Rohtas) hydro-electric projects.

Non Conventional Sources of Energy:

There are huge possibilities of non-conventional and renewable sources of energy in Bihar. Through hydro-electricity, bio-gas energy, solar energy and wind power, energy requirements of rural areas can be solved to a greater extent. Renewable Energy Development Authority has been appointed as nodal agency for the electrification and for the development of programmes of renewable source of energy in the remotest villages through non-conventional sources of energy in Bihar.

In Bihar 92 prospective places have been identified where small hydro-electric projects can be developed, whose total generation capacity is 46.1 Megawatts.

With these production plans in Bihar there is also potential of production of 200 Megawatts of energy through biomass based electric projects.

For the establishment of wind power based electricity projects and for the identification of adequate prospective places the nodal agency of the state with the help of Chennai is making an effort to take wind resource estimation programme in their control.

Biogas is an important renewable source of energy and is capable of fulfilling the energy needs of rural areas for cooking food. Continuous efforts are being made in this direction and 1.25 lakh plants have been established till now.

QUESTIONS

OBJECTIVE TYPE QUESTIONS

1. Possibilities of finding mineral oil in Bihar –
   (a) In Himalayan region (b) In south Bihar plain
   (b) Hilly regions of south Bihar (d) In Ganga Basin

2. In which industry is limestone mainly used?
   (a) Cement industry (b) Iron industry
   (c) Lead industry (d) None of these

3. Pyrite is a mineral –
   (a) Metallic (b) Non-Metallic
   (c) Nuclear (d) Fuel

4. In the gold ore of Bihar the extraction of pure gold per tonne is–
   (a) 05 to 06 Gram (b) 0.1 to 0.6 Gram
   (b) 00.00 to 0.1 Gram (d) 0.001 to 0.003 Gram

5. In which district is Kahalgaon thermal power project situated?
   (a) Bhagalpur (b) Munger
   (c) Jamui (d) Sahebganj

6. In which district is Kanti thermal power project situated?
   (a) Purnea (b) Siwan
   (c) Muzaffarpur (d) East Champaran

7. How many large projects are being run by B.H.P.C. in Bihar?
   (a) 3 (b) 10
   (c) 5 (d) 7

8. What is the total electricity generation capacity of hydro-electric projects in operation in Bihar?
   (a) 35.60 Megawatts (b) 44.20 Megawatts
   (c) 50.60 Megawatts (d) 30 Megawatts

SHORT ANSWER TYPE QUESTIONS:

9. Where is Mica found? What are its uses?
10. Write about distribution of Graphite and Uranium in Bihar.
11. Mention about thermal power centres in Bihar.
12. Describe the hydro-electricity being produced in Son river valley project.
13. Describe the hydro-electricity development in Bihar.

LONG ANSWER TYPE QUESTIONS:

14. Classify the minerals found in Bihar and write about distribution and utility of any one category of minerals.
15. Describe the major sources of energy in Bihar and discuss in detail any one source?

ACTIVITY:

Explain about the importance of Wind Energy and Biogas in your village or Mohalla.

BIHAR : INDUSTRIES AND TRANSPORT

Majority of the large industries became a part of Jharkhand after the division of Bihar as most of them were situated in Chotanagpur region, and large industries almost vanished from the map of Bihar. Still there is no dearth of prospects of development of industries here.

All the favorable geographical conditions are available here for the development of industries, Raw materials for the industries are also available in neighboring states and all mining areas are connected with convenient rail routes and roadways. Agriculture and other resources for industries along with various types of natural resources and facilities are available.

Do You Know?

There was no favorable geographical condition available in New England of United States of America but still this state on the merit of its hard work and from the raw material of its neighboring states has presented a good example of industrial development.

In India for the Iron and Steel industry situated at Bhilai, all the raw materials particularly coal comes from neighboring states.

During tenth five year plan period the industrial development rate was 9.8 percent but the industrial income of Bihar was only 0.4 percent of the total industrial income of the country (2004-05). There is also one more fact that in all the industrial regions of the state there is greater number of registered industrial units whose income is half of the total income of this region.

According to the 2007-08 survey report of the Government of Bihar, the total number of large and medium industrial units in Bihar is 262 which are confined to the limited areas only. Maximum centralisation of large and the medium industries is in Patna region (38.2%) where as it is 21.6 percent in Tirhut region and 9.7 percent in Magadh region.

There is more development of small, very small and micro industries In Bihar. They play an important role in providing job opportunities. In 2007-08 job opportunities equal to 5.5 lakh human days were provided by them. It is also estimated that in Bihar 1500 small scale industries, 98000 very small/ micro industries and 68000 handicraft units are present. In the counting conducted by the third All India Small Scale Industries (2001-02). There are only 72.6 thousand permanently registered small scale industrial units in Bihar, out of which 52.1 thousand are working units. The small, very small and micro and handicraft units are spread all over the state.

Do You Know?

The first sugar mill of India was established by a Dutch company at Mobitiya.

In Bihar one tonne of sugar is produced from 10 tonnes of sugarcane.

Before 1960 one third of sugar of India was produced from here.

Agro-Based Industries:

Sugar Industries : Sugar industry is an important industry of Bihar. With this, the development of many associated industries also takes place. Till the mid twentieth century, Bihar had a very important position in the sugar industries of India. But after 1960, this industry experienced decline and now it is on the seventh position, despite the fact that all the favourable Geographical conditions are present here. Therefore, some improvement can be seen in recent years which is clear from the table No. 1.1

	2004-05	2005-06	2006-07
Total area under Sugarcane cultivation (In Lakh Hectares)	2.27	2.30	2.52
Sugarcane Production (In Lakh Tonnes)	125.82	129.95	143.64
Production of Sugar (In Lakh Metric Tonnes)	5.54	4.22	4.52
Crushing Period (In Days)	85	126	150

Previously, there were 29 sugar mills in Bihar but in 2006-07 its number came down to only 09. At present, the total production of Sugar

is 4.52 lakh metric tonnes.

Most of the sugar mills of Bihar are developed in the North-west region. The sugar mills are located in West Champaran, East Champaran, Siwan, Gopalganj and Saran districts due to the fact that this area is highly suitable for sugarcane cultivation.

Few sugar mills of Bihar are located in Sakri, Lohar, Hasanpur of Darbhanga district and Motipur of Muzaffarpur district. There are few sugar mills which are located in the southern portion of the state also, among them are Bikramganj, Bihta and Guraru sugar mills.

Emphasis has been given to encourage sugar production in the state during the eleventh plan period and particular thrust has been given to increase sugarcane production and area of its cultivation. There is a plan to restart 15 closed sugar mills and two under construction units of Bihar State Sugar Corporation. The state government has also decided to hand over the responsibilities of eleven sugar mills to Reliance, Hindustan Petroleum and multinational companies.

The sugar mills also produce electricity, paper, molasses and Ethanol along with sugar. At present special attention is being given to produce its bi products in the sugar mills and several new projects.

Jute Industries : Jute is an important industry not only of Bihar but whole eastern India. Before independence there were 110 Jute mills in India and most of them were situated in West Bengal and Bihar but after independence most of the parts of Jute producing region went to Bangladesh, as a result of which this industry suffered a setback. There are three large Jute mills in Bihar which are situated in Katihar, Purnea and Darbhanga. At present only Jute mill at Katihar is working.

Tobacco Industry : Bihar stands sixth in tobacco production in the country. Bidi and Cigarette factories dependent on tobacco are situated at a number of places. In Munger, Imperial Tobacco is situated at Dilabarpur. For Bidi industry Tendu leaves are brought from plateau areas of Jharkhand. More than 250 Bidi factories are situated at Munger, Gaya, Patna, Jhajha, Lakhisarai, Jamui, Biharsharif, Ara, Buxar, Mahnar, Dalsinghsarai, Shahpur etc.

Rice, Pulses and Flour Mills : The most important crop of Bihar is Paddy. The Paddy is crushed to get rice. In the Tarai region of Bihar, a number of rice mills are situated. The other Paddy growing region is Bhojpur, Rohtas, Gaya, Jehanabad and Aurangabad in the South-West Bihar and so many rice mills are spread all over here. Maximum rice mills are situated in Bhojpur, Rohtas and East Champaran and the total number of rice mills is 520 in these districts. Apart from these, rice mills are situated in towns also. This work is also done in the form of cottage industry in the villages.

In the districts situated on the either side of river Ganga pulses are grown and that is why small mills of pulses have developed here. Among them Barh, Mokama, Barbigha, Shekhpura, Patna, Biharsharif are important.

In Bihar Flour, Maida, Suji and Dalia mills have also been developed. There are about 2000 flour mills here and they are mainly situated in Patna and Gaya. Flour mills have also developed in Bhojpur, Rohtas, Muzaffarpur, Darbhanga and Bhagalpur districts.

Oil Mills : In Bihar oil is extracted from Linseed, Raye (Tori), Mustard and Sunflower and they are cultivated also. There are 500 oil mills here (According to government of Bihar. It is situated all over the state but it is mainly concentrated in Patna, Gaya, Jehanabad, Nalanda, Rohtas, Bhojpur, Munger and Bhagalpur.

Non - Agro Based Industry

Leather Industry: In Bihar there is large population of Cows and Buffaloes and looking at the quality of their skin, there are huge possibilities for the development of leather industry. This industry has developed in Bihar mainly as cottage industry and about 50,000 labourers are engaged in making shoes and sandals. The leather industries are mainly situated in Bettiah, Muzaffarpur, Purnea, Katihar, Patna, Ara and Aurangabad.

In Bihar there are three associations of Leather industries (A) Bihar State Leather Industry Development Corporation and units established under its associated unit Finished Leather Limited, (B) Private leather processing factory at Muzaffarpur and (C) Bata Leather Processing and Manufacturing Industry at Mokama and Patna. During 1970s under the auspices of Bihar State Leather Industry Development Corporation, seven leather processing factories were established but due to financial constraints most of the units are closed. 7 out of 9 units established at Bela in Muzaffarpur district are still working. All the products produced here are sent to Bata units situated in Tamil Nadu and Madhya Pradesh to manufacture leather goods.

There are 5 units working under Bihar State Leather Industry Development Corporation which manufacture Boots and Safety Boots. Fancy shoes and sandals are manufactured by Bata units. There are roughly 10 cottage industry units which are working in unorganised sectors and are situated at Muzaffarpur, Bettiah, Danapur and Patna and its sub-urban areas. Two large units of Bata situated at Danapur (Now known as Bata Ganj) and Mokama, where along with the manufacturing of shoes and sandals training is also imparted.

Textile industry is an ancient industry of Bihar and this industry has been dominated by a particular community. This work is done in both rural and urban areas. The Tasar silk cloth Lungi and Bed sheet of Bhagalpur are famous worldwide. The Carpets manufactured at Obra of Aurangabad district and Daudnagar are in great demand all over India. Cotton, Silk and Woolen clothes are also manufactured in Bihar.

Due to lack of raw materials, the cotton textile industry has not developed much in Bihar, but due to cheap labour and available market, this industry has developed at Dumraon, Gaya, Mokama, Munger, Phulwarisharif, Ormanjhi and Bhagalpur. Small mills are established here. Thread is brought from Kanpur and Ahmadabad.

The maximum development of Silk industry has taken place at Bhagalpur. Directorate of Handloom and Silk cloth has been established through which silk cloth industry has been developed on regional basis at Bhagalpur, Muzaffarpur, Gaya and Darbhanga. Under this Directorate, Varanasi Saree industry at Bhabhua and production of silk cloth at Nalanda and Nawada has been encouraged.

In Bihar the development of woolen industries is almost nil, only blankets etc are manufactured from the wool of local sheep. Blankets and carpets are manufactured at Obra of Bhagalpur and Daudnagar area and apart from these blankets are also manufactured at Munger, Muzaffarpur and Patna districts from the wool of local sheep.

The handloom sector is a large industrial sector of Bihar. There are 34, 320 Looms here out of which 10, 817 are in co-operative sector and 23, 503 are in non co-operative sector. Apart from these there are 11, 361 electric operated Looms. The handloom industries are mainly concentrated in Patna, Gaya, Bhagalpur, Banka, Darbhanga, Arwal, Jehanbad, Aurangabad, Bhabhua, Nawada, Khagaria, Nalanda, Madhubani and Siwan districts. Here there are 1089 primary weaver co-operative associations and total number of weavers are 1, 32, 294 (94 thousand in government and 34, 367 are in co-operative sector).

In 2007-08 to encourage this industry under new scheme Fair and exhibitions, textile parks, Handloom parks, Handloom clusters scheme, Jute park, workshop and seminar schemes, integrated handloom development scheme, Mulberry and Tasar projects are being organised, also loom modernisation scheme for the weavers, availability of generators for electric operated looms and scheme for modern training for weavers.

Mineral Based Industries

There is scarcity of minerals in Bihar, only limestone and pyrite is available in sufficient amount. Among mineral based industries Cement industry, Chemical industry and Glass industry are important.

Cement Industry:

Limestone is the most important raw material for cement industry. Generally for the production of one tonne cement 2.02 tonnes of raw material is required. Limestone is mined in the hills of Kaimur in

the state. About 5% of the total limestone of the country is found in Bihar. Cement industry is situated at Dehri on son near Dalmianagar in Rohtas district but presently it is closed and in sick state. The government of the state is giving priority to small factories of cement. That is why there is an ambitious plan to open mini plants in Rohtas and Kaimur districts.

Chemical Industry:

Acid, base and fertilizer are the main products of chemical industry. The most important fertilizer factory in Bihar is situated at Barauni which is known as Hindustan Fertilizers Industry. Its production capacity is four lakh tonnes. Meptha is received from Barauni petro chemical. Apart from this color, Varnish, Oil, Soap, Medicine and chemicals of lighter class is also manufactured here.

Glass Industry:

This industry is an ancient industry here; previously glass bangles were made here but now with the development of medicine industry glass industry have also developed. For bottles and other works sand, silica, soda ash, limestone, sodium sulphate, potassium carbonate, shora, suhaga, Boric Acid, lead, sukha sankhiya, Berium oxide etc. are required as raw materials. Here Glass is manufactured at Patna, Hazipur, Darbhanga and Bhagalpur.

Industries Based on Forest Products

Among forest based industries wood, paper, pulp and lakhs of other industries have been developed.

In Bihar on the border of Nepal, wood industry is situated at Narkatiaganj, Jogbani, Bairgania, Gopalganj, Muzaffarpur, Samastipur, Patna, Bhagalpur and Katihar. Hazipur and Bettiah are famous for plywood factories. Due to ample availability of sugarcane Bagasse, rice bran, bamboo, sawai grass and soft wood, the paper and pulp industry has developed here. The important paper factories situated here are Thakur Paper Mills, Samastipur and Ashok Paper

Mills, Dalmianagar. Small paper mills are situated at Barauni and Patna.

Lac insects grow particularly on palas, Berry, Kusum etc trees and these trees are sufficiently found in Nawada, Gaya, Banka, Munger and Punea districts. Therefore, Lac industry is situated in these districts.

Tourism Industries:

Bihar has the potential to develop tourism as a full blown industry. The ancient monuments and ruins of historical value of Bihar are of international importance. Its cultural heritage, religious places, natural beauty has the potential to attract people from all over the world. In the tourism map of Bihar Baudh temples, Jain temples, Gurudwara of Sikhs and Dargah of sufi saints are present. Among these tourist places number of destinations like Rajgir, Patliputra, Vaishali, Bodh Gaya, Nalanda, Pawapuri, Patna sahib, Gaya, Sultanganj, Balmikinagar, Dev, Sonpur, Sasaram, Maner, Biharsharif are famous.

No particular attention has been given to this industry in Bihar but still there is increase in the national and international tourists here. According to 2007-08 government report 61.30 lakh tourists in 2003 and 1.07 crores tourists in 2006 visited Bihar which earned a profit of 156 lakh to the Bihar State Tourism Development Corporation which is more than the previous years. The number of tourists who visited the state in 2006 is clear from table number 1.2.

Year	Indian	Foreign	Total
2003	6044170	60820	6105530
2005	8667220	63321	8730541
2006	10670268	94446	10764714

Source- Government of Bihar, Economic survey, 2007-08

Other Important Industries : Apart from the above mentioned industries, there are few more industries which have developed here, among them are oil refinery and petro chemical industry at Barauni, Gun factory at Munger, insecticide industry at Purnea and Plastic industry at Bettiah. Thermal power stations are established at Kahalgaon, Barauni and Kanti.

Cold storage and industries associated with potato (Powder and chips) have been established in Nalanda.

Do You Know?

A large railway workshop was established at Jamalpur in 1875. In which 10 thousand laborers got employment at that time and it was the first workshop of Asia.

Recently foundation stone has been laid by the the government of India for four large industrial units such as railway coach factory at Harnaut, ordnance factory at Rajgir, organic fertilizer factory at Chandi and railway wheel manufacturing industry at Dariapur (Chapra). Apart from these, thermal power stations at Barh and Nabinagar are under construction.

The central government has established a public sector managed heavy industry enterprise Bharat Wagon and Engineering Company Limited at Mokama. It manufactures railway wagon and engineering goods. Diesel engine work is being done at Jamalpur in Munger district; here a large railway workshop is also situated.

Information technology is also developing in Bihar these days. Patna silicon park has been developed and many institutions are also working in the field of computer hardware.

Following are the main reasons for the industrial backwardness of Bihar.

(i) Scarcity of raw materials: The scarcity of raw materials is the biggest problem. Here not only minerals are scarce but because of the reduction of area in sugarcane and jute cultivation, the problem of scarcity of raw materials has been created and therefore, many factories related to them are closed.

(ii) Lack of structural facilities: Lack of transportation, power, storage and market facilities.

(iii) Scarcity of capital and technical knowhow for the modernisation is the main cause for the decline of agro-based industries and Jamalpur factory. The closer of cement industry and many units of Barauni are due to this reason only.

(ii) The memorandum of understanding for foreign investment was signed but actual investment is not there; interest is there in consumer industries but there is no interest in basic industries; the internal capital is basically invested in hospital and hotel industries which gives immediate profit but still with the implementation of new industrial policy, 2006 and steps taken by the present state government to encourage new investment has given a new boost to this sector. At present 245 proposals for investment have been received in the state through which investment of 57.84 thousand crore rupees is proposed. State Investment Proposal Board (SIPB) has already recommended 115 proposals from these through which 40.72 thousand crore rupees investment is expected. Through Bihar Industrial Area Development Authority (BIADA) enterprising steps have been taken in this field. Important thing is that land was allotted to 15 units for the projects with an investment of 172.45 crore rupees in 2006-07. On the contrary this year land has been allotted to 627 new units which has an investment of 4, 218.62 crore rupees. Previously it used to take a lot of time in allotment but now BIADA has made arrangements for the allotment in 24 hours for new units. The construction work on Normal Basic Slurry refinement plant with an investment of 1.5 crore rupees has started, the first food park of Bihar is expected to develop here. Construction of Handloom Park at Bhagalpur and Begusarai, establishment of cargo complex at Patna airport and inland container depot at Fatuah is proposed for establishment.

Transportation:

Most of the part of Bihar is plain and therefore, almost all means of land transport has developed here. The northern portion of the state remains flood effected and so the development of normal means of transportation is less in this area in comparison to the southern part. Basically development of roadways, railways and limited development of waterways, airways and ropeways have been done here.

Roadways:

In Bihar, at first roadways was developed and it is one of the ancient means of transportation in Bihar. Not only this, the contribution of two emperors (Ashoak and Shershah) here, in the development of roadways should be written in golden letters. More extension of roadways in Bihar has occurred after independence, at the time of independence the total length of different types of roads was 2, 104 Km. whereas the present total length is 81, 680 Km. The present roadways have been classified in to five categories from the administrative and personnel point of view. The following table 1.3 (A) shows the length of these roads.

Table 1.3 (A)

Road Network in Bihar

Length of the roadways (in Km.)

Sl.	Types/Class	Metteled	Unmettled	Total	Percent of the total
1.	National Highways	37, 34.00	0.00	37, 34.00	4.57
2.	State Highways	3849.00	0.00	3849.00	4.71
3.	Important District roads	7017.25	0.00	7017.25	8.59
4.	Other District roads	2828.00	990.00	3818.00	4.67
5.	Rural Roads	27400.00	35861.63	63261.63	77.46
	Total Length	**44828.47**	**36851.63**	**81680.10**	**100.00**

Source - Government of Bihar, Economic survey, 2007-08

Source- Government of Bihar, Economic survey, 2007-08

National highways connect Bihar with other states and regions. The most important national highway in Bihar is National Highway No.2, it is also known as Grand Trunk Road and it was built by Shershah during the Mughal period. The total length of national highways in Bihar is 3, 734.00 Kilometers.

After Grand Trunk road, the other road going up to Uttar Pradesh border is Gopalganj Pipra Kothi-Muzaffarpur - Barauni highway number 28 which is 266.30 Km. in length. Similarly, Ara-Buxar high number 84, Chapra-Siwan Gopalganj highway number 85, Mokama Farraka (Highway Number 80), Gaya - Rajgir Biharsharif-Barbigha Sarmera Mokama highway number 82 which is 147 Km. in length. The longest road in Bihar (398 Km. long) is highway number 31, it is Rajaulighat Bakhtiarpur Barauni road. Among the national highway development project, NH 77 and 28 from Patna to Muzaffarpur is being converted in to four lane by NHA 1. Under the golden quadrilateral plan by national authority 206 Km. and under East -West corridor 512 Km. road crosses through the state.

Do You Know?

The total length of Grand Trunk Road in Bihar is 204 Km. This road runs from Kolkata in the east up to Delhi and Peshawar (Peshawar now in Pakistan). This national highway crosses through Sherghati, Sasaram, Mohania in Bihar. Now this road has been converted in to four lanes and is under National Highway Authority (NHA.I).

The central road construction ministry has decided to undertake the construction of most of the roads in north and south Bihar in to their own hands.

There are few proposed national highways in Bihar which is given in table 1.3 (B).

Table 1.3 (B)

The Proposed National highways of Bihar

Sl.	No.	Name	Length
01	98	Phulwari, Bhusaula, Naubatpur, Vikram, Arwal, Aurangabad	110.00
02	99	Dobhi (NH2) Lilaganj	10.00
03	101	Chapra, Baniyarpur, Maharajganj, Barauli (NH28)	60.00
04	102	Chapra, Rewaghat, Muzaffarpur (NH28)	80.00

05	103	Hajipur, Musridhrari (NH28)	55.00
06	104	Chakia, Narhar, Pakri Bridge, Madhubani, Sheohar, Sitamarhi, Harlakhi, Umargaon, Jainagar, Kharauna, Narhiya (NH57)	160.00
07	105	Darbhanga, Onsi, Jainagar	66.00
08	106	Maheshkhut, Sonbarsa, Simri Bakhtiarpur, Bairati, Saharsa Baijnathpur, Madhepura, Murliganj, Purnea (NH31)	145.00

Source Road Construction Department, Government of Bihar (2004).

There is extension of 3849.22 Km. state level roadways in Bihar; these roads are maintained by government of Bihar and they mainly connect district headquarters.

The district level roads have also been developed in Bihar. All roads are mettled and their total length is 7017.25 Km. These roads connect main towns and sub-divisions of the district. Other district level roads connect sub-division and block headquarters. Some roads are unmettled (990.00 Km.) and 2828.00 Km. long road is mettled. The main district roads and other district level roads are constructed and maintained by Public Works Department (PWD).

The maximum coverage of roads in the state is of rural roads, its total length is 83261.36 Km. in which 24.400 Km. is mettled and 35861.63 Km. are roads. This is 77.46 percent of the state roads. These roads are constructed and maintained by village Panchayat or Block development office. These roads are less broad in comparison to other roads.

At present greater emphasis is given on the development of roads. It includes repair of the total highways, renovation and up gradation work. In the year 2006-07 total 773 Km. and up to January 2008 total 552 Km. national highways were renovated. The upgradation of the state highways is also in progress along with the important district roads. In the year 2006 total 1054 Km. roads have

been declared as state highways and with the help of Asian Bank the upgradation work of these roads in to double lane highways is in progress. In the year 2008 total 722 Km. roads have been declared as state highways.

Many roads of Bihar go up to the international borders also. These roads go up to Nepal border.

In many areas due to natural obstructions the extension of roads is less. Among them are flood affected areas of Kosi basin, Tal, Chaurs, Diara and other flood affected areas. Most of the roads of north Bihar are affected by floods and it obstructs the transportation.

Due to construction of bridges at many places on river Ganga, the contact between north and south Bihar has increased. After the construction of Mahatma Gandhi Setu, direct contact of capital Patna and south Bihar has been established with north Bihar.

One more bridge on river Ganga is under construction near Munger, after its completion direct contact between north-west Bihar and south Bihar will be established. A bridge is under construction on river Son at Arwal with an investment of almost one hundred crores; once the bridge becomes operational the distance between Rajgir and Saman Nath will greatly be reduced and communication for the tourists will become convenient. One bridge on river Gandak between West Champaran and Gopalganj and on river Kosi large bridges between Saharsa and Darbhanga are under construction. After the completion of all these large bridges the road communication will become more developed. For establishing contact with the distant and rural areas construction work is in progress on over one thousand five hundred small bridges. The Bihar State Bridge Construction Corporation Limited is responsible for the construction of bridges in the state.

As a result of the development and expansion of the roads in the state, the number of motor vehicles is continuously increasing. In the

year 2005-06 the number of registered motor vehicles was 80,363 which increased to 1, 47, 309 in 2006-07.

Table 1.4

Year	Truck	Bus	Car	Taxi	Jeep	Auto Rickshaw	Two Wheelers	Tractor	Tractor	Others	Total
2005-06	579	113	5062	427	2321	3273	61333	509	2440	1306	80363
2006-07	1989	921	7409	1326	4430	5027	112985	6160	5281	147309	147309

Source Department of Transport, Government of Bihar.

Railways: At first the development of railways took place in Bihar during British period in 1860. During this period, first railway line was constructed along river Ganga up to Kolkata by East India Company. This railway line was mainly constructed for defense and administrative purposes and through this contact of Patna was established with west and east India. After this east-west rail route was constructed in north Bihar. Like this the development of rail route continued further.

Till the last decade of the nineteenth century, many places of erstwhile Bihar was connected to Kolkata. By the mid twentieth century or at the time of independence, with the development of metre gauge in north Bihar many towns were connected whereas in south Bihar mostly broad gauge was developed. After independence, after the completion of Rajendra Setu near Mokama in 1959 contact between north and south Bihar through railways was established.

Till 2001 total length of railways in this state reached 6, 283 Km. and in 2002 headquarters of east-central railways was established at Hajipur. In 2003 the rail line was further developed and Fatuah-Islampur broad gauge rail line was laid, after this Rajgir-Natesar rail line was extended. Rajgir to Bodh Gaya via Hisua rail line is being laid. Banka was connected to Bhagalpur-Mandar hill rail line.

Laying of rail line in progress on from Mandar hill up to Dumka. Between Digha-Sonepur construction work of Rail Bridge on river Ganga is in progress. On Kiul Ganga route, work is in progress to connect Koderma south of Tilaiya station and Rajgir in north.

In the inner parts of the state passenger, Express, Shuttle, E.M.U. and D.M.U. trains are operating. For big and famous cities Intercity Express trains are running. Work on several projects is on for the development and expansion of the railways. Electrification of Kiul-Mugalsarai rail line and Patna-Gaya rail line has already been done. Patna Junction has already been extended up to Rajendra Nagar. Double track is being laid on Patna -Gaya route.

Water Ways:

Bihar is a land-locked state. This is the reason why it has no connectivity with the sea route. Here, rivers are used for waterways. There are many large rivers in Bihar which remain full of water throughout the year. Perhaps this is the reason why water transportation has remained popular since ancient times in the state. Water ways was a important means of transportation during medieval period also, this the reason why development of cities took place on the bank of the rivers. Ganga, Ghaghra, Kosi, Gandak and Son rivers are mainly used for water transportation. Food grains through Ghaghra river, wood, fruits and vegetables through Gandak, sand through Son and through Punpun river bamboo is transported but siltation, floods and scarcity of water in rivers during summer season is obstructing water transportation. Steamer facility is available on many ports of river Ganga but due to the construction of the bridges its operation has reduced considerably. In river Ganga large boats are plying for local works.

At present, Haldia-Allahabad national waterways has been developed in river Ganga and recently National Ship Institute has been established near Mahendru ghat. There is possibility of development of the water transport system in the canals constructed for irrigation purposes from the rivers. Many canals drawn from the river Son in

south Bihar have been made navigable. The Ara canal drawn from western Son canal presents convenience of boat transportation. Work is going on several projects for transportation through canals.

Air Ways:

Because of the poor economic situation in Bihar, there is no adequate development of Air ways here. Only at Patna and Bodh Gaya, Air ports of international importance have been developed. The Patna Air port is known as Jai Prakash International Air port. From here air service for Kathmandu, Kolkata, Mumbai, Lucknow, Ranchi and Delhi are available. Weekly flights are available from Bodh Gaya for Bangkok. Apart from these, there are seven Air Ports at Muzaffarpur, Jogbani, Raxaul, Bhagalpur, Bihta etc. Patna — Bodh Gaya service has also started and Haj travelers depart from Patna and Bodh Gaya by special Aircraft.

The private companies also provide air service from Patna Air Port. Among them Jet Airways, Jet lite, Kingfisher and Sahara are important. There is a flying school and flying club at Patna.

Rope ways:

Rope ways are used for mountainous and inaccessible places. A rope way has been developed in Bihar for going to 'shanti Stupa' on Gridhkut mountain at Rajgir. It was constructed by government of Japan in 1972 and now it has been handed over to Bihar State Tourism Development Authority. Mandar hill in Banka district will soon be connected by rope way, it is a famous place for Jain pilgrimage.

QUESTIONS

OBJECTIVE TYPE QUESTIONS

1. In which city of Bihar is Glass industry situated?
   (a) Hajipur (b) Shahpur
   (b) Murkunda (d) Bhavani Nagar

2. Where is the Cigarette factory situated?
   (a) In Munger (b) In Patna
   (c) In Shahpur (d) In Gaya

3. Where is the railway workshop situated?
   (a) Jamalpur (b) Bhagalpur
   (c) Munger (d) Patna

4. Where is the fertilizer factory situated?
   (a) Barauni (b) Barh
   (b) Mokama (d) Lakhisarai

5. In which city is Carpet manufactured?
   (a) Obra (b) Daudnagar
   (c) Biharsharif (d) Gaya

6. In which district is Ashoak paper mill situated
   (a) Samastipur (b) Patna
   (c) Purnea (d) Araria

7. Is the first rail line of Bihar?
   (a) Martin Lite Railways (b) East India railways
   (c) Indian Railways (d) Bihar rail service

8. What is the name of Patna Airport?
   (a) Jai Prakash International Airport
   (b) Patna Airport
   (a) Rajendra Prasad International Airport
   (d) Bihar Airport

9. What is the national highway number of Grand Trunk road?
   (a) 1 (b) 2
   (c) 3 (d) 4

10. When was the railway started in Bihar?
   (a) From 1842 (b) From 1860
   (c) From 1848 (d) From 1862

11. Where is the East-Central railway headquarters situated?
   (a) In Patna (b) In Hajipur
   (c) In Muzaffarpur (d) In Samastipur

12. What is the total length of the railways in the boundaries of Bihar?
   (a) 6, 283 Km. (b) 5, 283 Km
   (c) 7, 283 Km. (d) 8, 500 Km.

13. Where is the rope way situated in Bihar?
   (a) Biharsharif (b) Rajgir
   (b) Gaya (d) Banka

14. In which district is Mandar hill situated?
    (a) Munger (b) Bhagalpur
    (c) Banka (d) Buxar

15. On which port of Patna is National Ship Institute situated?
    (a) Mahendru Gha (b) Gandhi Ghat
    (c) Digha Ghat (d) Baans Ghat

SHORT ANSWER TYPE QUESTIONS:

1. Write a note on Jute Industry of Bihar.
2. Mention the names of important industrial centres situated on the bank of Ganga
3. Describe the initiatives taken by BIADA for industrial development.
4. Describe the important points of new industrial policy.
5. Which workshop is situated at Jamalpur and why is it famous?
6. Present your view on the industrial development of Rajgir.
7. Describe the different industries which have developed at Munger.
8. The roads are more developed in south Bihar in comparison to north Bihar. Why?
9. What is the contribution of rivers to transportation in Bihar?
10. Write the names of important Airports of Bihar. Where are they situated?
11. Describe the railways of north Bihar.
12. Present your views on waterways in Bihar.

LONG ANSWER TYPE QUESTIONS:

1. Describe the development and distribution of any one agro-based industry of Bihar.
2. Describe in detail about the cloth industry in Bihar.
3. Describe the extension and development of important road ways in Bihar.
4. Discuss in detail the rail or water ways of Bihar.

ACTIVITY:

Locate G.T. road on the map of Bihar and also identify important cities and famous places situated on the side of the road.

BIHAR : POPULATION AND URBANISATION

Bihar has been a region of dense population from the very beginning. Evidences of human habitation which dates back to 3000 years are found here. During Magadh period, over 80 thousand villages flourished. Even today, it is one of the most densely populated states of India. Main cause for this is Its geographical location, in other words plain land surface, fertile soil, perennial rivers that remains full of water throughout the year and convenient accessibility. At present as per the size of the population, Bihar is on third position after Uttar Pradesh and Maharashtra and from the point of view of population density it is on second place after west Bengal. According to the 2001 census, its total population is 8, 29, 98, 509 of which 4, 32, 43, 795 are male and 3, 97, 54, 714 are females. This population is 8.07 percent of the total population of India.

Do You Know?
Bihar is the least urbanised state among all large states of India.

According the to Central Accounts Organisation (CAO) in 2007, the population of Bihar has increased to 9.31 crores. The decadal growth rate during 1991-2001 period was 28.62 percent whereas the national growth rate is 21.11 percent. 89.05 percent of the total population of Bihar lives in rural areas.

The sex ratio in Bihar is 919 females on per thousand male. This is less than the national ratio of 933. So far as age classification is concerned, in Bihar the maximum percentage of population is found in 0-6 and 7-14 age groups (Table 1.6). The main cause for this is the high birth rate.

Table- 1.6

Age Group Classification of the population of Bihar (2001 Census)

Total Groups	Total	Male	Female
0 – 4	13.3	13.0	13.5
5 – 9	15.4	15.5	15.3
10 –14	13.3	13.8	12.8
15 –19	8.7	9.3	7.9
20 – 24	7.6	7.3	7.9
25 – 29	7.1	6.7	7.6
30 – 34	6.7	6.3	7.1
35 – 39	6.1	6.0	6.3
40 – 44	5.0	5.1	5.9
45 – 49	4.2	4.1	4.2
50 – 54	3.3	3.6	2.9
55 – 59	2.5	2.3	2.7
60 – 64	2.5	2.6	2.5
65 – 69	1.6	1.6	1.7
70 – 74	1.2	1.3	1.2
75 – 79	0.5	0.5	0.5
80 - +	0.7	0.7	0.6
Untold Age	0.2	0.0	0.2
Total Age group	100.0	100.0	100.0

There are 83.23 percent Hindus and 16.53 percent Muslims in the total population of Bihar. Other than this, Christian, Sikh, Baudh and Jains also live here which is clear from the table 1.7.

Table 1.7
Classification of Population according to Religion

Sl.	Community	Population	Percent
1.	Hindu	6, 90, 76, 919	83.23
2.	Muslim	1, 37, 22, 048	16.23
3.	Christian	53, 153	0.06
4.	Sikh	20, 780	0.02
5.	Baudh	18, 818	0.02
6.	Jain	16, 085	0.02
7.	Followers of other Religion	52, 905	0.06
8.	Unknown Religion	37, 817	0.05

According to National Institute for Public Co-operation and Child Development (NIPCCD) related to Indian women as noted in 2007 and economic survey, government of Bihar 2007-08, the birth rate in Bihar was 30.4 in 2005 whereas the national average was 23.8. Similarly the death rate was 8.1 whereas the national average was 7.6. Because of the high birth rate the annual growth rate, the population of Bihar is 2.23 percent where as the national average is 1.63 percent.

Population Distribution:

The distribution of population of Bihar is not even everywhere. At places, it is very thickly populated and at places it is very sparse. Social settings and physical diversity are the main causes for this.

We find greater concentration of population where the land surface is even, alluvial and plain. Again we find thick population in those areas also where facility of irrigation, modern techniques of agriculture is being utilised, per capita income and urbanisations is more. This is the reason why we find greater concentration of population in Patna, Nalanda, Muzaffarpur and Bhojpur districts.

Patna district has maximum concentration of population in Bihar. Here on 3.40 percent of the total area of the state 5.68 percent of the total population is found, the main cause for this is that Patna city is the capital of state, and urbanisation, development, administrative centre, commercial, industrial and tourism service centers are situated here.

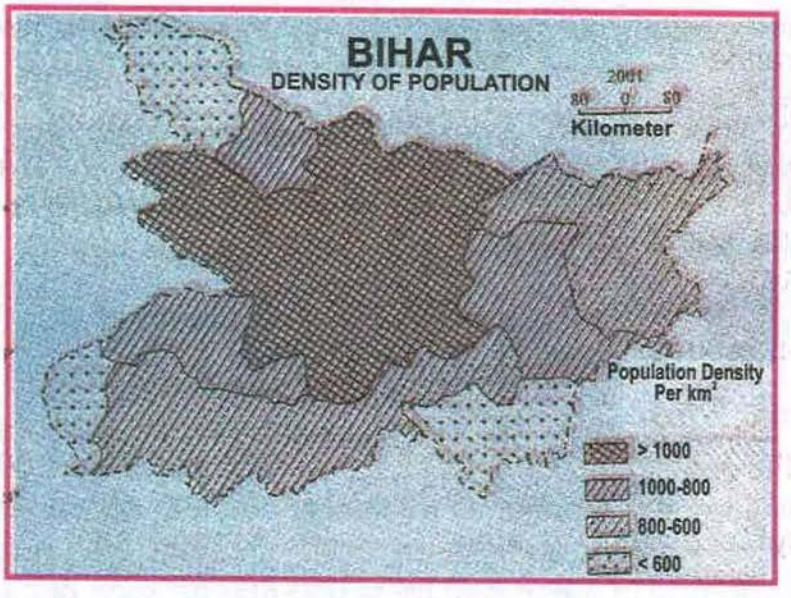
Do You Know?
The district with maximum population in Bihar is Patna and Patna town is also a town of maximum population.

In Gaya, Muzaffarpur, Purnea, Hajipur, Bettiah, Motihari, Chapra, Siwan, Darbhanga, Madhubani, Sitamarhi and Samastipur districts the population percentage ranges between 3.00 -5.00 percent. These districts are densely populated districts of Bihar and among them only Gaya district is located in South Bihar and rest 11 districts are located in North Bihar. This is 39 percent of the total area of Bihar and in these districts 46 percent population of the state is concentrated.

Supaul, Nawada, Aurangabad, Araria, Gopalganj, Bhojpur, Begusarai, Nalanda, Katihar, Bhagalpur, Rohtas, Munger, Khagaria, Kaimur, Kishanganj, Jamui, Buxar, Saharsa, Jehanabad, Arwal, Madhepura and Banka are among medium populated districts. The population percentage of these districts ranges between 1.00-2.99 percent.This is 54.85 percent of the total area of Bihar and in these districts 45.84 percent population of the state is concentrated. Here due to development of agriculture and urbanistion positive population concentration is found.

In Sheohar, Sheikhpura, Lakhisarai districts the population percentage is less than 1.00 percent (between 0.60-0.97). In these three districts, on only 2.48 percent of the total area of Bihar 2.22 percent population of the state is concentrated. In these districts due to agriculture backwardness and less area the concentration of population is less.

North Bihar is comparatively more densely populated where 43.80 percent of the total area of the state and 63.42 percent population is concentrated. On the contrary, in south Bihar on 56.20 percent area 36.58 percent of the total population of the state is concentrated.



Population Density:

According to 2001 census the population density of Bihar is 881 persons per square kilometer. The maximum density is in Patna district where population density is 1, 471 persons per square kilometer, after this Darbhanga and Vaishali is placed where population density is 1, 342 and 1, 332 persons per square kilometer respectively. On fourth position is Begusarai district with a density of 1, 222 persons per square kilometer.

The population density is very uneven in different districts. On the basis of this uneven distribution of population, Bihar can be divided into following five categories.

1. **Districts of very high density :** Those districts which are having population density of over 1200 persons per square kilometer

are categorised in this category. Patna, Darbhanga, Vaishali, Begusarai, Sitamarhi, Saran, Siwan etc come under this category. On 17.50 percent land of the state, 28.17 percent of its population is found in these districts.

2. Districts of high density : Those districts which are having an average population density of 1000 - 1200 persons per square kilometer are categorised in this category. Muzaffarpur, Samastipur, Gopalganj, Madhubani and Nalanda come under this category. On 14.41 percent land of these six districts of Bihar, 19.25 percent of its population is found.

3. Districts of medium density : Under this category 800-1000 persons per square kilometer lives. East Champaran, Bhagalpur, Jehanabad, Arwal, Bhojpur, Saharsa, Khagaria, Madhepura, Buxar and Munger districts come under this category. On more than 24 percent land of the state in these districts, 18 percent of state's total population is found.

4. Districts of less density : Under this category Purnea, Katihar, Araria, Nawada, Sheikhpura, Supaul, Gaya, Kishanganj, Lakhisarai, Rohtas and Aurangabad districts are included. The average density of these districts is 600-800 persons per square k.m. In these districts on 30 percent of the total area of the state 26 percent of the total population is found.

5. Districts of very less density : Those districts which have an average population density of less than 600 persons per square kilometer are categorised in this category. Included under this category are West Champaran, Banka, Jamui and Kaimur districts whose population density 382 persons per square kilometer. On 14.58 percent of the total area of the state 9 percent of the total population is found.

Development of the Cities:

The history of development of cities in Bihar is very old. Most of the cities here have developed on the bank of the rivers. The ancient cities have developed here in the form of capital, education, religious

and trade centers. Patliputra, Nalanda, Rajgir, Gaya, Vaishali, Bodh Gaya, Udvantpuri, Sitamarhi etc are examples of ancient cities. During medieval period also the development of cities and roads took place due to administrative reasons. Among these cities Sasaram, Darbhanga, Purnea, Chapra, Siwan etc are included. During English period, many changes took place in Bihar when rail and roadways were developed and because of this towns began to develop along the roads. At this time, few cities were also developed due to railways. After independence there was rapid development of the cities. Due to industrial, health, education and development in basic needs of life many new cities were also developed among them Barauni, Hajipur, Danapur, Dalmianagar, Munger, Jamalpur, Katihar are important, but at present there is very less development of cities in Bihar in comparison to other large states of India and is least urbanised state of the country. The total urban population here (according to 2001 census) is only 10.5 percent where as urban population of India is 27.78 percent. At present there are only 19 cities in Bihar with over one lakh population and Patna is the only city with more than ten lakh population. According to 2001, census the total number of urban settlements is 131.

The functional structure of cities in Bihar is related to its evolution. Here the ancient cities were related to administration and trade but modern cities are related to industry, transport, trade and education. From the beginning almost all the district headquarters have developed here on the basis of urban functions such as whole sale business, education and health along with administrative work. Most of the towns situated in the plain areas here are related to these functions. The industrial units are established at selected cities in Bihar; important among them are Dalmianagar, Munger, Barauni, Jamalpur and Katihar.

Before the division of Bihar, Tata Nagar was the only planned city of the state. Jamshed Ji Tata was the first to introduce modern town planning not only in Bihar but also in whole India. However, but after the partition of the state development of planned city has not taken place in Bihar. Even Patna which is a famous town since ancient times has developed as a partial planned town. This city is the capital of Bihar. Most of the towns of Bihar are unplanned and unorganised. Barauni and Valmikinagar can be categorised in to planned city to some extent.

QUESTIONS

OBJECTIVE TYPE QUESTIONS

1. The total population of Bihar in 2001 was -
   (a) Less than 8 crores (b) More than 9 crores
   (b) More than 8 crores (d) None of these

2. The population growth rate of Bihar during 1991-2001 was...?
   (a) 30 percent (b) 28 percent
   (c) 28.63 percent (d) None of these

3. The rural population in Bihar is.....
   (a) 89.5 percent (b) 79.5 percent
   (c) 99.5 percent (d) Zero percent

4. How many persons live in per square kilometer in Bihar according to 2001 census?
   (a) 772 persons (b) 881 persons
   (b) 981 persons (d) 781 persons

5. Which district has the highest population?
   (a) Bhagalpur (b) Patna
   (c) Nalanda (d) Munger

6. The Sasaram city developed -
   (a) In medieval period (b) In ancient period
   (c) In present period (d) In modern period

7. .....was the only planned town in the undivided Bihar.
   (a) Patna (b) Munger
   (c) Tata Nagar (d) Gaya

8. The urban population of Bihar according to 2001 census is....
   (a) 20.5 percent (b) 15.5 percent
   (c) 10.5 percent (d) 25.5 percent

9. Which is the largest city of Bihar?
   (a) Patna (b) Gaya
   (c) Bhagalpur (d) Darbhanga

SHORT ANSWER TYPE QUESTIONS:

1. Write the name of district of Bihar with maximum density.
2. Which are the districts in Bihar with least density.
3. Explain the population size of Bihar.
4. The population of Bihar is not even at every place. Clarify?
5. How did the cities develop in the medieval period?
6. Write the names of two ancient and two modern cities?

LONG ANSWER TYPE QUESTIONS:

1. Discuss in detail the population density of Bihar.
2. Present an analysis of urban development in Bihar.