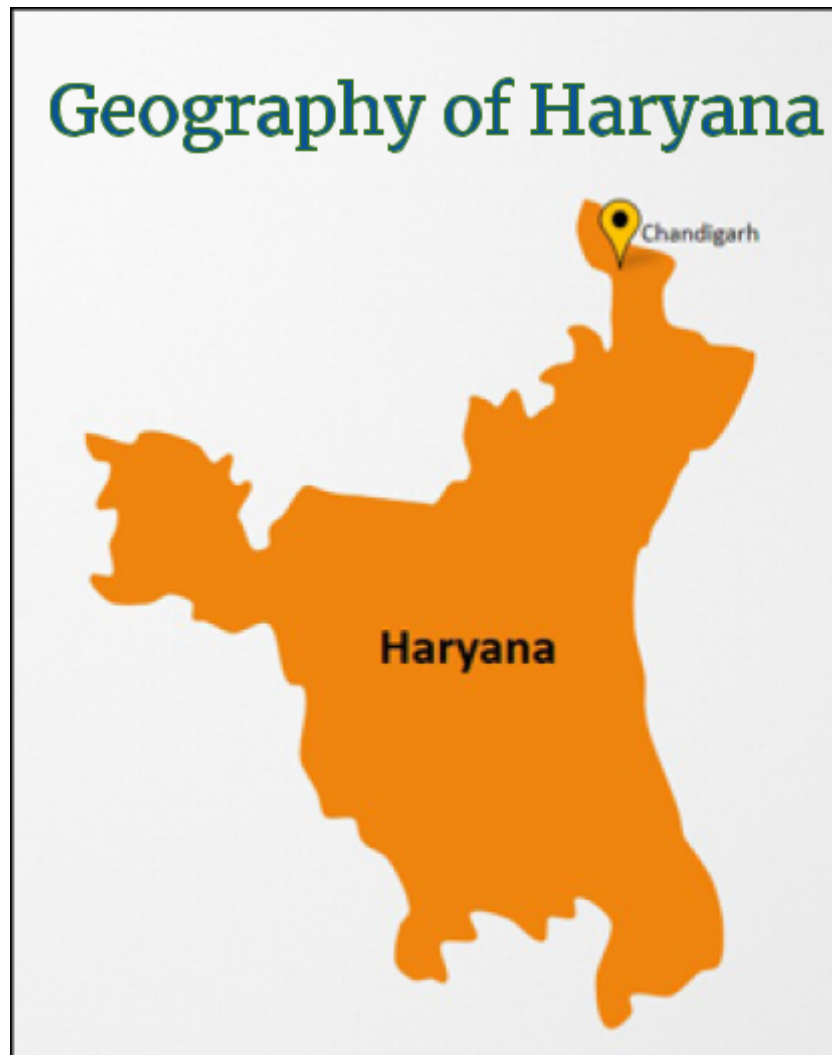


Haryana Civil Services



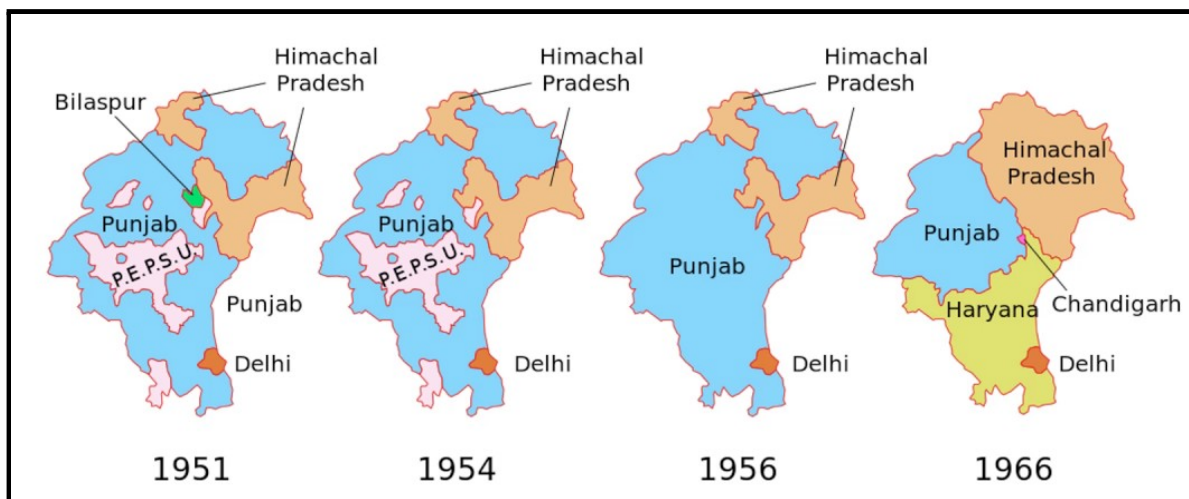
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Geography of HARYANA

• Introduction:

- *Haryana* is located in the **North-Western** part of India.
- The present day Haryana came into existence on **1st Nov 1966**.



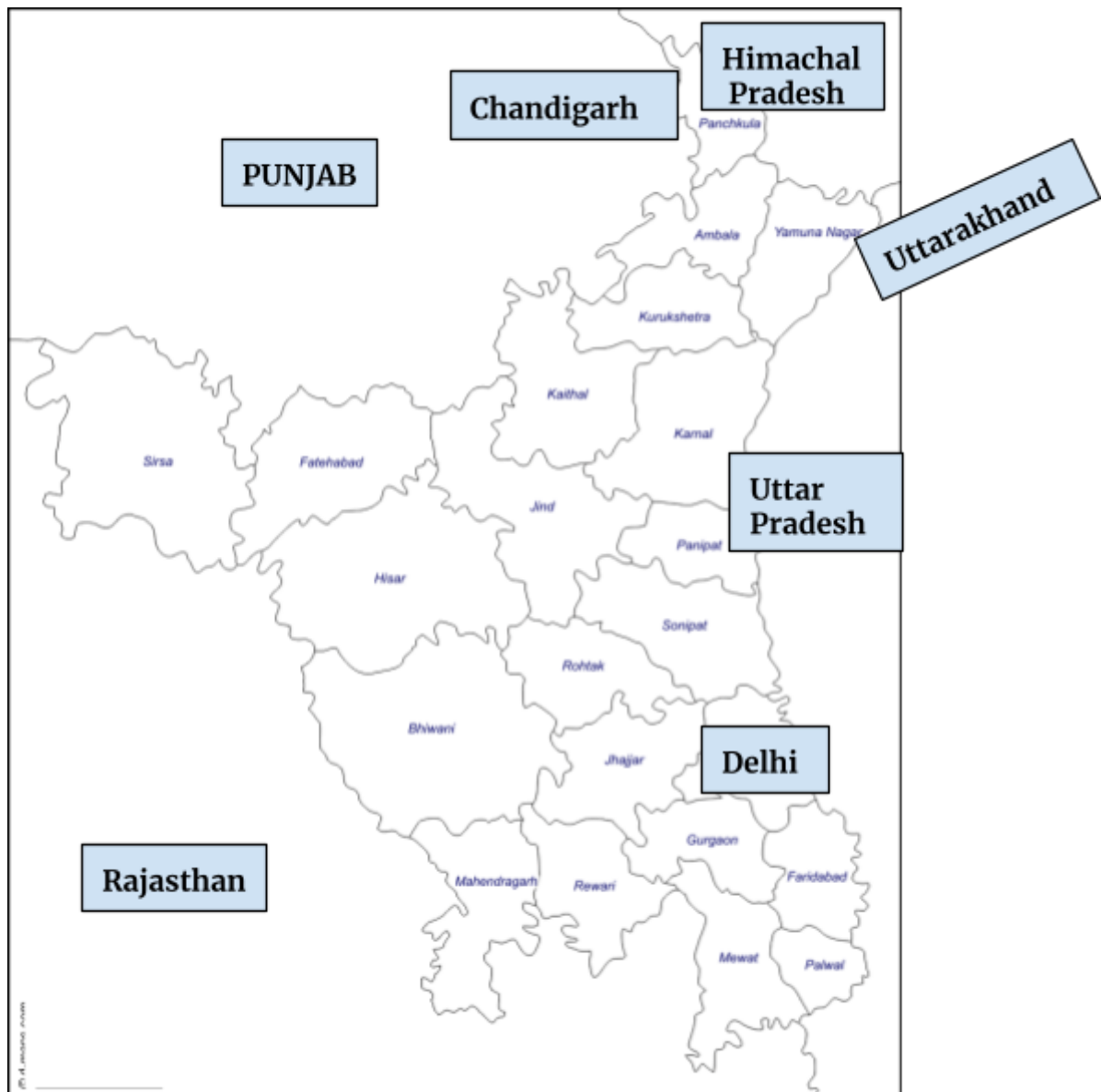
- Capital of Haryana is **Chandigarh**, which is administered as a Union Territory.

• Extensions:

Latitude	Longitude
27°39'N to 30°35'N	74°27'E to 77°36'E

- Present day Haryana has an Area of **44,212 sq. kms**
- It constitutes **1.37 %** of the total geographical area of India.
- It constitutes less than **2%** of the India's population.
- Amongst 29 states of India, *size wise* Haryana comes at **21st** rank.
- **1/3rd** total area of the state falls under the *National Capital Region*.
- The plain area of Haryana is the part of Indo-gangetic plain which has been formed due to the deposition of alluvial sediment.
- **Borders:** Haryana is a *Landlocked state*

North	Himachal Pradesh
South & South-East	Rajasthan
North-West	Punjab & Chandigarh
East	Uttar Pradesh & Delhi
North-East	Uttarakhand



Physiography:

- The Haryana is a plain area except some part of Shivaliks in north and Aravallis in the south.
- The plains of Haryana are part of *Indo-Gangetic plains*, formed by the deposition of alluvium brought by the rivers from the himalayas.



- Haryana is divided into 4 geographical divisions:

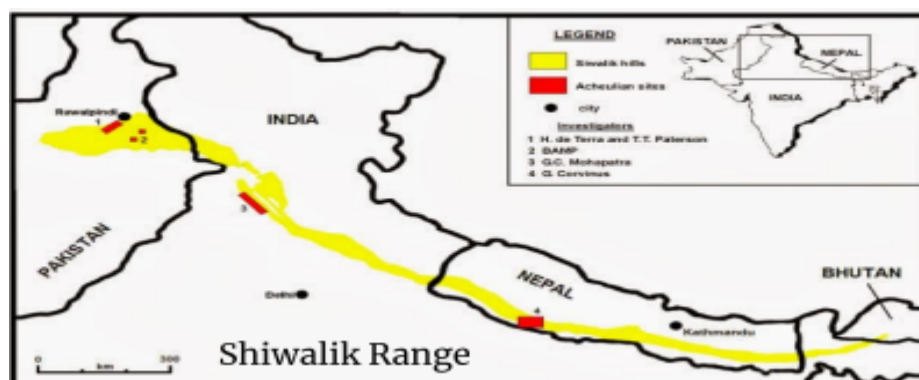
Shivalik Hills
Ghaggar-Yamuna Plains
Semi-arid Sandy area
Dry area of Aravalli Hills

1. Shivalik Hills:

- This hilly area lies at 900-2300 m height in the Northeastern part of the state.
- Emerging Rivers:

Ghaggar	Tangari	Markanda	Saraswati
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- Limestone found here is used in cement industries.
- This covers areas of Panchkula, Ambala and Yamunanagar districts.



2. Ghaggar-Yamuna Plains:

- The plains are entirely composed of alluvial deposits and makes for the **largest area** of the state.
- It is drained by the tributaries of

Yamuna	Ghaggar
--------	---------

- It is divided into 2 parts:

Higher	BANGAR
Lower	KHADAR

- Khadar** are *low-lying areas* that are floodplains of a river.
- Khadar areas are prone to flooding .
- It is moisture retentive and sticky when wet *Khadar* soil consists of new alluvial soil deposits and is often very fertile.
- The *Khadar* is also called *Nali* in the northern Haryana which is the fertile tract between the Ghaggar river and the southern limits of the Saraswati that gets flooded during the rains.

- Bangar** areas are beyond floodplains that lie more *upland*, and consist of older alluvial soil.
- Bangar area are less prone to flooding but are usually more sandy and less fertile as well.

- The alluvial plain is made up of sand, silt, clay and hard calcareous stones known as **kankars**.
- Sheesham, neem, peepal banyan* trees are found here.

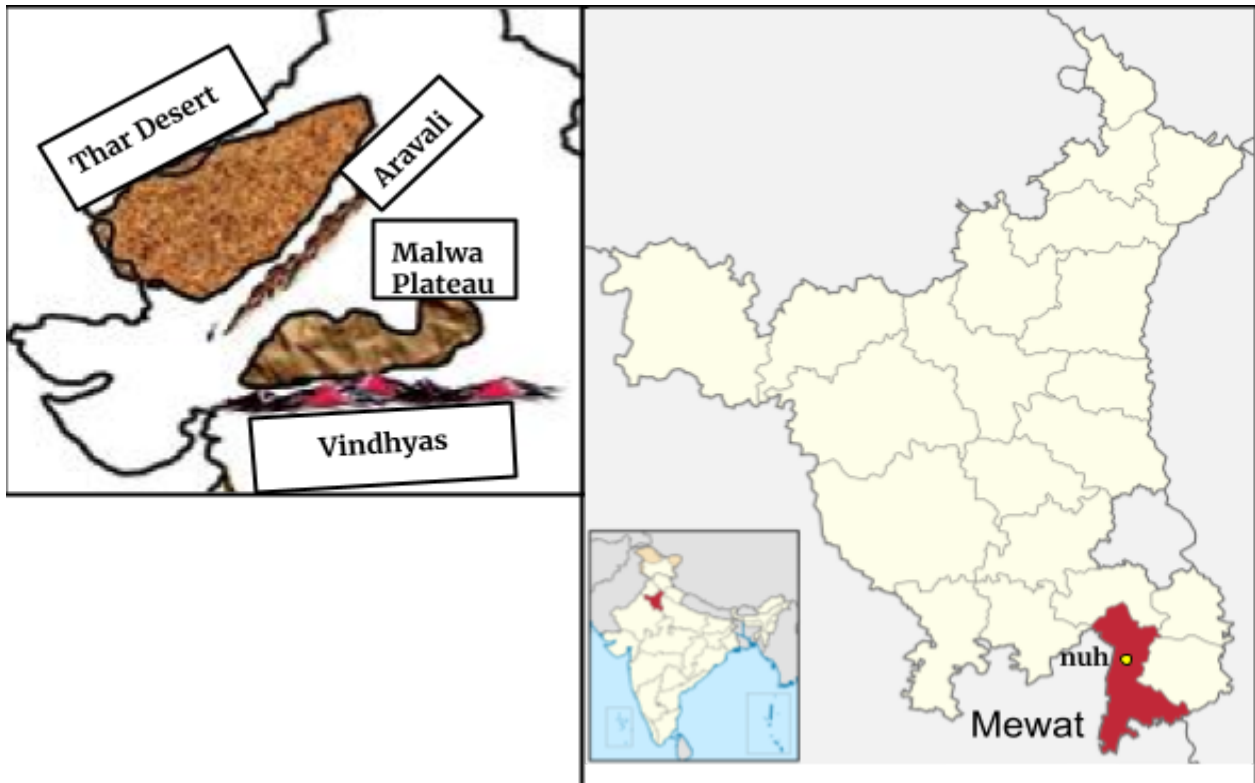
3. Semi-arid Sandy area:

- The area includes district of Sirsa, parts of Hisar, Mahendragarh, Fatehabad, Bhiwani and borders with Rajasthan.
- There are present small number of **sand dunes** at different places of varying heights and magnitude.
- Scanty rainfall is caused by the warm wind which blows here.
- Keekar, Khair, Thorn* trees are found here.
- Xerophytes* as well as *scrubs* are found here.

- Xerophytes** are plants which are adapted to dry/desert areas.
 - They are a type of succulent plant.
 - To survive these harsh conditions they have special features.
 - For example, a cactus has white hairs which help to prevent water loss.

4. Dry area of Aravalli Hills:

- The dry irregular hilly areas of Aravalli are found in *southern* part of Haryana.
- This range is an offshoot of Aravalli Ranges situated in Rajasthan.
- The *limestone* and *slate* are found in the rocks.
- Due to scanty rainfall *Xerophytic vegetation* is found in the area.
- Aravalli ranges are situated in the *Nuh (Mewat)* area of Gurgaon district of Haryana.



Climate of Haryana

Temperature:

- Haryana experiences *subtropical, semi-arid to sub-humid, continental and monsoon type* of climate.
- Here *summers* are **very hot** and *winters* are **severely cold**.
- The hottest months are *May* and *June* and the coldest months are *December* and *January*.
- The average temperature of summer is 35°C to 48°C , reaches upto 50°C in May and June.
- In winters the temperature in January falls upto 0°C , with average being 3°C – 9°C

Rainfall:

- The state receives *scanty* rainfall with *Shivalik hills* region being the *wettest* and the *Aravali hills* region being the *driest*.
- The average annual rainfall of the state is *560 mm*, ranging from *300 mm* in the south-western parts to *1000 mm* in tracts of shivalik hills.
- The rain occurs **twice** a year:

Monsoon season (80% rainfall)	June – Sept
Winter season	Dec–Feb

- The amount of *Monsoon rainfall(80%)* is *more than the winter rainfall*.
- Haryana has **3 main climate regions**:

REGION	MEAN RAINFALL(mm)	AVERAGE TEMP.(° C)
Hot Arid	300–500	27
Hot semi-arid	500–750	26
Hot sub-humid	750–1000	24

- **Green areas**

Ambala, Kurukshetra, Yamunanagar, Karnal, Panipat, Gurugram (Gurgaon), Rohtak, Sonipat and Faridabad

- **Non-green**

Gurugram (Gurgaon) and Nuh (Mewat) areas of Faridabad

- *Maximum rainfall receiving areas:*

Ambala, Yamunanagar, Kurukshetra, Kaithal, Karnal, Jind, Sonipat and Panipat

- *Minimum rainfall receiving areas:*

Sirsa, Hisar, Bhiwani, Rewari, Rohtak, Faridabad, Gurgaon and Mahendragarh.

Climate change and its impact on Haryana:

- Climate change has emerged as one of the most serious socio-economic and environmental concern.
- In 1992 India adopted “*United Nation Framework Convention on climate change*”(UNFCCC), a global initiative to tackle climate change.
- **Article 3** of UNFCCC “*The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.*”
- The *climate-sensitive sectors* of Haryana such as *Agriculture* and *Forestry* are closely linked to the natural resource base of the state and hence faces an increased risk of negative impacts of climate change.
- Haryana would adopt a climate friendly, equity based and sustainable developmental path taking into account “*Common but Differentiated Responsibilities*” of UNFCCC.

Common But Differentiated Responsibilities

- CBDR is based on relationship between industrialization and climate change.
- The more industrialized a country is, more likely that it has contributed to climate change.
- States came to an agreement that developed countries contributed more to environmental degradation and should have greater responsibility than developing countries.
- CBDR principle could therefore be said to be based on *polluter-pays* principle.

- The *climate change initiatives* to be started in the state:
 - Energy efficiency
 - Renewable energy resources
 - Adaptive management in Agriculture
 - Climate friendly technologies
 - 3-R campaign – Recycle, Reduce, Reuse.

Drainage System of Haryana

- The rivers flowing through the state of Haryana are :

Yamuna	Ghaggar	Tangari	Markanda	Saraswati	Sahibi	Dohan	Krishnawati	Indori
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- Yamuna, Saraswati and Ghaggar are the main rivers of Haryana.
- Several small streams flowing through the state are Markanda, Sahib and Indori.

Yamuna

- It also known as the *Jamuna* is the longest and the second largest tributary river of the Ganga.
- It *originates* from the *Yamunotri Glacier* at a height of 6,387 metres on the south western slopes of *Banderpooch peaks* in the uppermost region of the Lower Himalaya in *Uttarakhand*.
- It crosses several states:

Uttarakhand	Himachal Pradesh	Haryana	Uttar Pradesh	Delhi
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- River Yamuna is situated at the *eastern* boundary of Haryana with *Uttar Pradesh*.
- It enters Haryana near *Kalesar forest* in the Yamunanagar district and is the source of large tracts of farmlands in the state.
- It flows through the south districts of *Yamunanagar, Karnal, Panipat, Sonipat* and exits Haryana near Hasanpur in *Faridabad* district.
- It flows in the districts of *Ambala, Kurukshetra, Karnal, Hisar and Rohtak* through *Western Yamuna Canals*(The canals have been constructed from which irrigation is done).

Ghaggar

- The river Ghaggar *only* flows during the *monsoon season*.
- It is an *intermittent river* that flows in *India and Pakistan*.
- It *emerges* from Shivalik ranges in *north-west* of Himachal Pradesh.
- It flows through *Pinjore* to meet river *Saraswati*.
- The Ghaggar flows towards *Rajasthan* and *disappears* in the *sandy desert of Ottu* in district Sirsa of Haryana.
- Along the banks of Ghaggar many *Indus Valley Civilization* settlements have been excavated.

Saraswati

- It is believed to be originated from Har-ki-Dun glacier in Garhwal (Uttaranchal).
- It was flowing parallel to river Yamuna, in which it later merged.
- The seasonal rivers like Ghaggar joined Saraswati while flowing through Punjab and Haryana.
- The river *Sutlej*(ancient name - "*Shatadru*") joined the Saraswati river at *Shatrana* in Patiala.
- Further it flowed through states of *Rajasthan* and *Gujrat* before emptying into *Rann of Kutch*.



Markanda:

- Markanda's ancient name is Aruna which is tributary of river Yamuna.
- It flows from Himachal Pradesh to Haryana through Ambala and Karnal districts.
- This water surplus river flows into Sanisa Lake where it joins river saraswati.
- The river has very low flow which rises abruptly during monsoons.

Sahibi:

- Sahibi river emerges from Aravalli ranges of Rajasthan and flows in the Southern part of Haryana.
- In the Sandy part the water of this river is very little which later on converts at Najafgarh lake in the form of a Nala.

Indori:

- It flows only in the rainy season
- It rises near old fort in Mewat hills in Rajasthan
- It flows from south to north before merging into Sahibi river.

Tangari

- River Tangari emerge from Shivalik ranges.
- Near Mulana, river Tangari merges with Markanda.
- River Markanda merges with Ghaggar near Tithana.

Dohan and Krishnawati rivers

- Normally Dohan and Krishnawati rivers are dry.
- They are seasonal in the southern part of the state.

Lakes and Famous Tanks

- In Haryana there are several lakes, which increase the natural beauty of the state.

(i) Brahma Sarovar:

- The Brahma Sarovar tank is a *sacred water body* in *Thanesar* district.
- There is a statue of *Lord Shiva* in the sarovar which can be reached by a bridge.
- The tank stands spectacular during *Gita Jayanti* in the end of November and the beginning of December with “*Dheep Dhaan*” (floating lamps in water) & “*Aarti*” taking place.
- A dip in this tank is said to bestow the fruits of performing the *Ashvamedha Yajna*.

(ii) Sannihit Sarovar:

- The word “*sannihit*” means ‘to collect’.
- The Sannihit Sarovar is supposed to be the confluence of the *seven holy Sarasvatis*.
- It is believed that a bath in Sannihit Sarovar on a *no moon* days and on day of *eclipses* earns the merit of an *Ashwamedha Yagya*. Devotees come here from far and wide to take a dip in this lake and receive blessings from the gods.
- A *number of shrines* dedicated to various gods and goddesses including *Sri Hanuman*, *Lord Vishnu*, *Dhruv Bhagat*, *Goddess Durga*, *Lakshmi Narayan* and many others are situated near the sarovar.

(iii) Surajkund:

- A tourist place to visit in *Faridabad* is *Surajkund* which is said to have been created by the kings in respect of the *Sun God*.

(iv) Tilyar Lake:

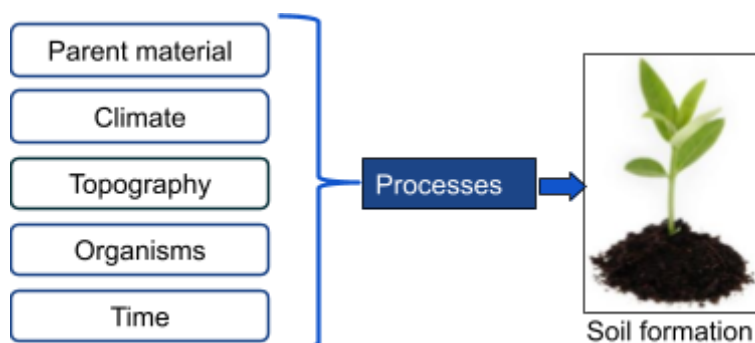
- Tilyar Lake is one of the greenest stretches in the region.
- It is an ideal destination for *water sports* for its facilities for kayaking, angling and boating.
- It has a *mini zoo* housing animals such as tiger, panther, deer, monkey, birds and many more.

(v) Badkhal Lake:

- The Badkhal Lake is a *natural lake* that is located in the *Faridabad* district of Haryana.
- The lake is surrounded by the *Aravalli* hills.
- A unique feature of this lake is that it is *rainwater fed* and hence remains dry for most part of the year.

Soils

- Soil is a mixture of organic matter, minerals, gases, liquids, and organisms that together support life. The Earth's body of soil is the pedosphere, which has four important functions: it is a medium for plant growth; it is a means of water storage, supply and purification; it is a modifier of Earth's atmosphere; it is a habitat for organisms; all of which, in turn, modify the soil.
- The word Soil originated from the latin word “Solum” which means “floor”.



Soils of Haryana

- Haryana is formed almost entirely of *alluvium*.
- The state of Haryana is situated towards the depressions of river *Ganga* and river *Indus*.
- Haryana is broadly a plain and moist land on the *watershed* between the basins of the two rivers.
- From *geographical point of view* Haryana can be divided into three parts :

Hilly	Plain	Sandy
Soils of Hilly area <ul style="list-style-type: none"> • The soil in this region is <i>stony</i>, which is found in the hilly area of Morni. 		
Soils of Plain area <ul style="list-style-type: none"> • The soil in this region is fertile with <i>yellow-brown</i> colour. • The soil has been left here by <i>Yamuna</i> and <i>Saraswati</i> rivers. • Different crops are grown in this soil. 		
Sandy Soils <ul style="list-style-type: none"> • This soil is found in an extensive area of <i>south-western</i> part of the state. • Its colour is light <i>brown</i>. • It is <i>transported</i> by the winds blowing from Rajasthan area. • Due to the scarcity of water, the <i>production</i> of crops is <i>poor</i>. 		

Area wise Analysis:

- The soil found in the *hilly area* of the state is **thin** and **stony**.
 - **Red soil** is found in *Sirsa* District.
 - **Sandy clay soil** is found in *Hisar, Bhiwani* and *Fatehabad*. With the help of irrigation a good quantity of crop is grown in this soil.
 - The formation of land in *Jind* district is formed by the *transported soil* of *Ghaggar* and *Yamuna* river.
 - The soil found in the *Rohtak* district is **clay** and **fertile**.
 - The soil of *Ambala* and *Kaithal* is of **yellow brown** colour. It is also stony at some places.
 - The fertile soil of *Faridabad, Kurukshetra, Panipat* and *Karnal* is of **yellow brown** colour.
 - The soil of *Rewari* and *Mahendragarh* is **light brown** colour. Here the soil is **sandy** and **infertile**.
 - In *Yamunanagar* different types of soil is found. **No fertile soil** is found. Here the soil lacks *Nitrogen* and *Phosphorus*. Here **red chestnut soil** is also found.
 - In the sub hilly tract of *Shiwalik* **clay, brown** and **sandy** soil is found
-

Agriculture

- Haryana is primarily a ‘*Agricultural state*’.
- About **70%** of the people are engaged in agricultural activities.
- *Wheat* and *Rice* are the major crops.
- Haryana is self sufficient in food production
- It is the *second largest* contributor to the central pool of food grains in India.
- **Two main types** of crops in *Haryana* are *Rabi* and *Kharif*

Rabi	Kharif
Wheat, Tobacco, Gram, Linseed, Rapeseed, Mustard	Rice, Jowar, Bajra, Maize, Cotton, Sugarcane, Sesame, Groundnut, Jute

- About **96%** of the land in *Haryana* is cultivable.
- About **75%** of the area is irrigated through *tubewells* and extensive *canal system*.
- Haryana was a significant contributor in the *Green revolution*(1970s) that made the country self-sufficient in food production.
- Haryana is a significant contributor in the field of ‘*Agricultural education*’.
- Asia’s biggest agricultural University –
 - “*Chaudhary Charan Singh Haryana Agricultural University*” is located at *Hisar*.
- The **main crops** of Haryana are given below district wise :

DISTRICT	CROPS
Yamunanagar	Wheat, Sugarcane, Gram, Maize, Paddy and Sun-flower
Rohtak	Bajra, Jowar, Sugarcane, Wheat, Cotton, Barley and Gram.
Kurukshetra	Wheat, Paddy and Sugarcane
Faridabad	Wheat, Bajra and Mustard.
Karnal	Sugarcane, Sunflower, Paddy.
Kaithal	Wheat and Paddy
Jind	Paddy, Bajra, Jowar, Pulses, Cotton, Sugarcane, Oilseeds, wheat, Gram,
Panipat	Barley
Mahendragarh	Wheat and Paddy
Rewari	Mustard, wheat, gram, Bajra, Sunflower
Jhajjar	wheat, rice and sugarcane
Fatehgarh	Rice, wheat and Gram
Panchkula	Rice, wheat and Gram
Hisar	Rice, wheat and Gram
	Cotton, Bajra, Maize, Paddy, Wheat, Gram, Mustard, Sunflower, Soybean

- **Sonipat**
 - is famous for good production of *Mango, Malta, Lemon* and *Guava*.
 - Here *Watermelon* and *Muskmelon* are grown from *April to June*.
 - *Sonipat* is famous in the world for the production of *Khumbi (Mushroom)*.
- **Yamunanagar**
 - Produces good quantity of *fruits* and *vegetables* like *Watermelon, Muskmelon, Mango* and *Aru*.
- **Gurugram (Gurgaon)**
 - *Vegetables* are grown here.
- **Cash crops**
 - *Mustard, Toria and Dua(Taramera)* are grown in huge quantity.
- **Basmati rice**
 - Basmati rice of *Karnal* is famous in the world.
 - *Karnal* is known as the “*Rice Bowl*”
 - Basmati rice is also grown in *Kaithal*.
 - *Basmati rice* of *Karnal* and *Kaithal* is exported to foreign countries.

Major Agricultural Issues in Haryana:

- Problem of decreasing size of farm holdings
- Decreasing cultivable area
- Increasing salinity
- Declining water tables
- Imbalance use of fertilizers and micro-nutrient deficiency
- Harsh climate
- Low forest cover(3.52%)
- Considerable area under rainfed farming(19%)
- Lack of processing, value addition and storage facilities
- The state is deficient in Pulses(*except Gram*), vegetables and fruits.

Way Ahead:

- *In situ* water harvesting (*Khet ka Pani Khet Mein*)
- Discouraging *flood irrigation* by promoting *micro irrigation*
- Irrigation management through *Water User Associations(WUA)*
- Enforcement of “*Ground water draft bill 2008*” & “*Preservation of Sub-soil Water Act 2009*”
- *Laser* land levelling and water delivery system through *pipes*
- Banning of crop *residue burning*
- Uninterrupted supply of electricity
- Use of *non conventional* source of energy
- Optimised use of *cow dung* as a fuel source

Irrigation

- After the formation of state in 1966, one of the priorities of the government has been creation of infrastructure to meet the growing demands of agriculture as well as drinking water.
- It was necessary as 47% of the state has brackish water.
- Over the years an extensive irrigation network has evolved consisting of 59 main canals.
- Out of total geographical area of 4.421 mha, 3.819 mha is culturable out of which 3.048 mha is covered by surface irrigation.
- Haryana being an *agricultural state*, needs irrigation for agriculture.
- The demand of water is fulfilled by *rain*.
- Due to *scanty rainfall* in the state, the scarcity of water is compensated by irrigating fields with different methods.
- The **main sources of irrigation** are:

Canals	Wells	Tubewells
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- Among them the canals play an important role.
- *Punjab, Haryana* and *Rajasthan* take the advantage of multipurpose projects constructed at Sutlej and Beas rivers.

Irrigation Network Systems in Haryana

Bhakra Canal – Culturable Command Area (CCA) of 1.383 mha in NW and Western parts

Western Yamuna Canal – CCA of 0.970 mha in NE and Central parts

Lift Canal – CCA of 0.556 mha in SW parts bordering Rajasthan

Gurgaon Canal and Agra Canal – CCA of 0.139 mha in the NE parts of Haryana

- In the state the water is lifted from the lower surface to the upper as well as to dry slopes.
- This process is an enterprising work which for the first time gave a real shape to this **lifting process** in India.
- **Lifting irrigation projects** have helped irrigation in some of the higher as well as dry sloped areas.

Lifting Irrigation Projects

Juhi

Siwani

Loharu

Jawaharlal Nehru

- In sandy and undulated areas of the state *sprinkle* and *dip technique* of irrigation has been started.

Sprinkle irrigation

It is a method of applying irrigation water which is similar to natural rainfall. Water is distributed through a system of pipes usually by pumping. It is then sprayed into the air through sprinklers so that it breaks up into small water drops which fall to the ground. The pump, valves, distribution pipes, and sprinklers are generally designed to apply water as uniformly as possible.

Drip irrigation

It is a type of micro-irrigation that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface. The goal is to place water directly into the root zone and minimize evaporation.

- The work is being done at *Rewari lift irrigation project*, while the *Nuh(Mewat) lift canal project* is under consideration of the government.
- Hathnikund dam**, costing 200 crores has been completed from which *Haryana, Uttar Pradesh* and *Delhi* will get additional water for irrigation.

Means of irrigation are in the different parts of state

North-Eastern	Central	South-Eastern	Sandy
In north-eastern part at foothills of Shivalik, <i>Ambala district</i> is situated.	<i>Karnal, Kaithal, Kurukshetra, Jind, Sonipat and Rohtak</i> are the districts situated in the central part of the district.	The portion of this region falls under <i>Gurugram (Gurgaon)</i> and <i>Faridabad districts</i> .	Sandy area belongs to <i>Hisar, Sirsa, Bhiwani and Mahendragarh districts</i> .
The amount of rainfall is <i>sufficient</i> .	The region gets <i>good amount of rainfall</i> .	This area receives <i>scanty rainfall</i>	The area receives very <i>little rainfall</i> .
Its plain area is <i>fertile</i> .	In winter here the farmers irrigate their fields with the help of <i>wells, Tubewells and Canals</i> .	Here irrigation is done with the help of <i>tube-wells and canals</i> .	Here the irrigation of crops is done with the help of <i>fountains attached to Tubewells</i> .

Canals

Western-Yamuna Canal

- This is the oldest and the main canal of Haryana.
- It emerges from river Yamuna, at Tajewala, situated at Jagadhri-Paonta road.
- Eastern Yamuna canal also emerges from this place.
- This canal has other branches also.
- Irrigation is done in Sonapat, Karnal, Jind and Rohtak districts.

Gurugram (Gurgaon) Canal

- This is the second important canal of the state.
- This canal emerges from river Yamuna at Okhla in Delhi.
- The areas of Gurugram (Gurgaon) and Faridabad are irrigated by this canal.

Bhakra Canal

- This important canal of the state emerges from river Sutlej near Nangal City.
- The areas of Rohtak, Sirsa and Hisar districts are irrigated by this canal.

Jawaharlal Nehru canal and *Bhiwani canal*

- These are the minor canals through which the irrigation is being done at Bhiwani and Mahendragarh districts. These minor canals emerge from *Bhakra Canal*.

Main Irrigation Projects

Nangal lift irrigation project.
 Hathnikund barrage project.
 J.L.N. lift irrigation project.
 Narwana irrigation project.
 J.L.N. irrigation project.
 Loharu lift irrigation project.
 Sanga lift irrigation project.
 Gui lift irrigation project.
 Jhajjar lift irrigation project.
 Western Yamuna Canal project.
 Siwani lift irrigation project.

Animal Wealth

- Haryana is a progressive state wherein livestock contributes to about 35% of the state's agricultural GDP.
- Haryana possess 2.5% of the country's Bovine population with 6.1 million buffalos and 1.8 million cows.
- The state is home to famous breeds of "Sahiwal" cows and "Murrah" buffalos(aka 'Black Gold')
- The Murrah breed buffalo of Haryana is famous in the entire country. The buffalo of this breed produces milk in major quantity.
- The biggest animal farm of Asia is in Hisar district of Haryana.
- A white revolution was started to increase the production of milk in the state.

Operation Flood

Operation Flood is the program behind "the white revolution." It created a national milk grid linking producers throughout India with consumers in over 700 towns and cities, reducing seasonal and regional price variations while ensuring that the producer gets a major share of the price consumers pay, by cutting out middlemen. The bedrock of Operation Flood has been village milk producers' co-operatives, which procure milk and provide inputs and services, making modern management and technology available to members. Operation Flood's objectives included:

- Increase milk production ("a flood of milk")
- Augment rural incomes
- Fair prices for consumers

Verghese Kurien is known as the 'Father of the White Revolution' in India

- The state has robust network of Milk-cooperative, led by "Haryana Dairy Development Cooperative Federation(HDDFC)" formed in 1970.
- There are five cooperative milk plants in the state

Ambala	Jind	Rohtak	Ballabhgarh	Bhiwani
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- The total annual milk production in the year 2015-16 has reached 8.4 million tonne.
- Cock-comb investigation laboratory has been established at Thaneshwar city in Kurukshetra.
- A semen bank has been established at Narnaul, the headquarters of Mahendragarh where the nitrogen liquid plant is also established.
- In per capita per day milk availability in 2014-15 is 800 grams against the national average of 322 grams.

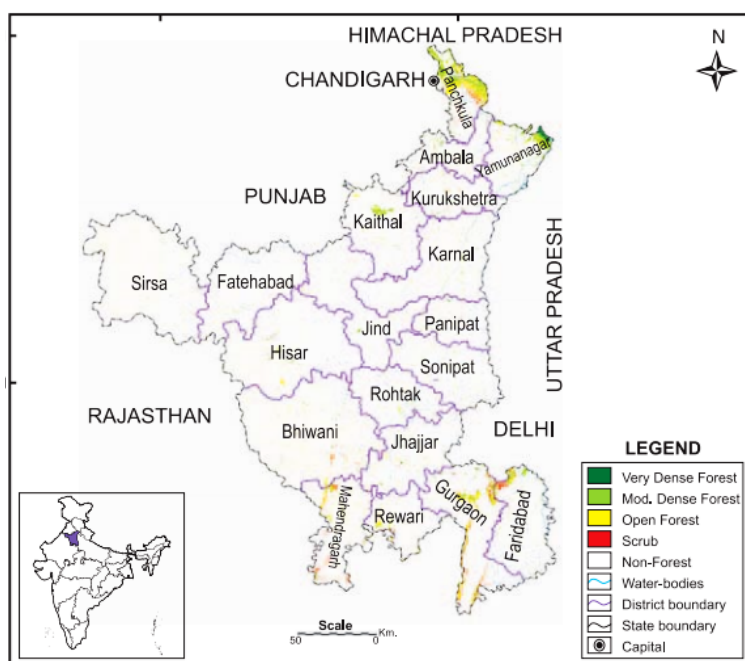
National Dairy Research Institute, Karnal

- This institute is under the control of *Indian Council of Agriculture Research (I.C.A.R.)*. In this institute the teaching, training and research are being done regarding dairying. The study of milk and milk product processing is being done in National Dairy Research Institute.

New Schemes for Animal Husbandry Development

- Scheme for conservation and development of indigenous cattle (*Gausamvardhan*)(2016-17)
 - Scheme for establishment of Hi-Tech and Mini Dairy Units (2016-17)
 - Scheme for Integrated Murrah Development (2016-17)
-

Forests



Land Use	Area in '000 ha	Percentage
Total geographical area	4,421	
Reporting area for land utilization	4,372	100.00
Forests	39	0.89
Not available for cultivation	524	11.99
Permanent pastures and other grazing lands	27	0.62
Land under misc. tree crops & groves	12	0.27
Culturable wasteland	65	1.49
Fallow lands other than current fallows	8	0.18
Current fallows	141	3.23
Net area sown	3,556	81.34

- The recorded forest area of the state is 1,559 sq km which only 3.53% of the geographical area.
- *Reserved forests* constitutes about 15.97%, *Protected forest* 74.28% and *Unclassified forest* 9.75% of the total forest area.
- Most of the roadside plantation have been notified as *Protected forests*.
- Haryana has -> 2 national parks , 8 wildlife Sanctuaries , 2 Community Reserves , 1 Deer Park , 3 Zoos and 5 Breeding Centres.

National parks
Sultanpur National Park, District Gurgaon Public Notice
Kalesar National Park, District Yamunanagar

Wildlife Sanctuaries
Kalesar Wildlife Sanctuary, <i>District Yamunanagar</i>
Bir Shikargah Wildlife Sanctuary, <i>District Panchkula</i>
Chhilchhila Wildlife Sanctuary, <i>District Kurukshetra</i>
Nahar Wildlife Sanctuary, <i>District Rewari</i>
Abubshahar Wildlife Sanctuary, <i>District Sirsa</i>
Bhindawas Wildlife Sanctuary, <i>District Jhajjar</i>
Khaparwas Wildlife Sanctuary, <i>District Jhajjar</i>
Khol Hi-Raitan Wildlife Sanctuary, <i>District Panchkula</i>

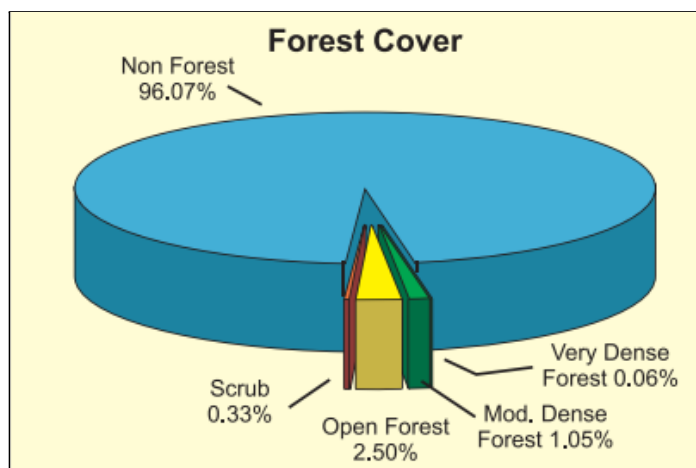
Conservation Reserves
Saraswati <i>District Kaithal, Kurukshetra</i>
Bir Bara Ban , <i>District Jind</i>

Deer Park
Deer Park, <i>Hisar</i>

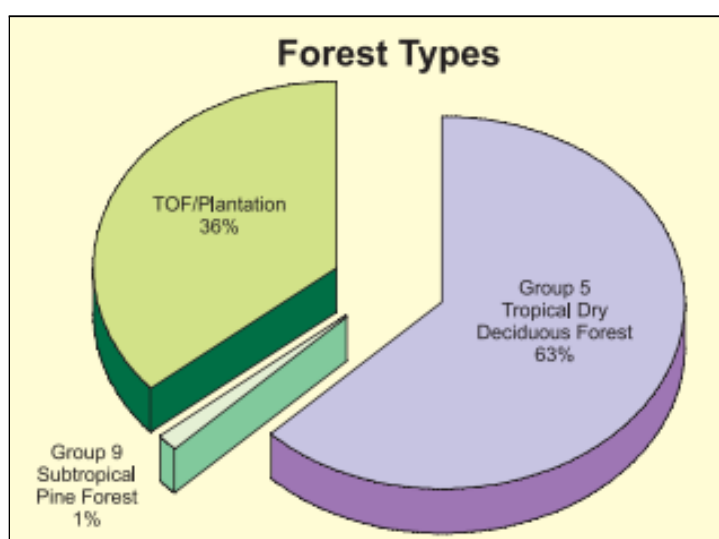
Zoos
Mini Zoo <i>Bhiwani</i>
<i>Rohtak Zoo</i>
Mini Zoo <i>Pipli</i>

Breeding Centres
Chinkara Breeding Centre, <i>Kairu</i>
Crocodile Breeding Centre, <i>Bhor Saidan (Kurukshetra)</i>
Vulture Conservation and Breeding Centre, <i>Pinjore</i>
Pheasant Breeding Centre, <i>Morni</i>
Peacock & Chinkara Breeding Centre, <i>Jhabua</i>

- Haryana is among the pioneers in implementing the *Joint Forest management* which began in 1976.
- The *total area under forests* in the state of Haryana is *1.75 lakh hectares* which constitutes 4.0% of the total geographical area.
- A *State Forest Policy* has been formulated in the year 2006.
- The forest Cover in the state from the data of 2004-2006 shows a loss of 10 sq km.



- The state has *5 different forest types* as per *Champion and Seth's Classification system*(1968) belonging to 2 type groups viz **Tropical Dry Deciduous** and **Subtropical Pine Forests**.



Category	Area	% of Geographical area
Tree Cover	1,409	3.19
Forest Cover	1,594	3.61
Forest & Tree Cover	3,003	6.80

- State Government has decided to establish *24 herbal parks* in each district and *Herbal Gyan Kendra* in each district, to promote the cultivation of medicinal plants.

- The **maximum forest** covered area is found in *Yamuna-Nagar district of Haryana*. Here *Sal, Khair, Sain, Chail, Shisham, Kikar, Sofedah and Chinar* trees are found.
 - In *Jind district of Haryana* *Shisham, Safedah, Neem, Mango and Kikar* trees are found.
 - *Two special courts of environment* have been established at *Faridabad* and *Hisar* district.
 - An *Elephant Rehabilitation and Research Centre* has been set up at *Bansantour Forest* in *Yamunanagar*.
-

Industries

- Industrialization plays a vital and crucial role in the development of an economy.
- It accelerates economic growth and thereby increases the contribution of industry sector in the State Domestic Product by way of increase in the production and employment.
- The state is one of the largest automobiles hubs and contribute to 2/3rd of the passenger cars, 50% of the Tractor, 60% of the motorcycles manufactured in India.
- The Industry Sector is the **second** largest contributor to the State GDP(3.63%)
- Haryana stands at **14th** rank among states in rankings based on *ease of doing business and reforms implementation* according to the **world bank report**
- The contribution of this sector in the State GDP had improved continuously before 2005-06. But thereafter, the share by this sector decreased considerably from 32.1% in 2006-07 to 30.6% in 2015-16.

- **Index of Industrial Production (Base Year 2004-05 = 100)**

Industry	2013-14	2014-15
<i>Manufacturing</i>	177.8(2.4)	187.6(5.5)
<i>Electricity</i>	252.7(3.8)	275.4(9.0)
<i>Basic Goods</i>	214.5(1.1)	226.4(5.5)
<i>Industries</i>	204.8(7.8)	239.1(16.7)
<i>Capital Goods Industries</i>	156.7(- 9.8)	171.4(9.4)
<i>Intermediate Goods Industries</i>	170.4(9.2)	164.3(- 3.6)
<i>Consumer Goods Industries</i>	187.1(4.5)	187.2(0.1)
<i>(a) Consumer Durable Goods</i>	158.9(13.5)	158.9(- 6.5)
<i>(b) Consumer Non-Durable</i>	184.0(2.6)	194.8(5.9)

Index of Industrial Production (IIP)

IIP is one of the Prime indicators of the economic development for measurement of trend in the Industrial Production over a year period of time with reference to a chosen base year.

● **Main Industries/Factories**

<i>Cement</i> –Charkhi Dadri (Bhiwani), Surajpur (Ambala)
<i>Sugar</i> – Yamunanagar, Panipat, Sonipat, Karnal, Jind, Shahabad, Palwal and Rohtak
<i>Paper</i> – Yamunanagar, Dharuhera, Faridabad, Jagadhari and Sonipat
<i>Cotton Textile</i> – Hisar, Bhiwani, Faridabad, Rohtak
<i>Agriculture–implements Industries</i> – Faridabad
<i>Woollen Textile</i> –Hisar and Panipat
<i>Leather Industry</i> –Faridabad and Jind
<i>Utensils Industry (Copper and brass)</i> –Rewari
<i>Utensils Industry (China–clay)</i> – Bahadurgarh, Gurugram
<i>Plastic Industry</i> –Faridabad
<i>Bata–Shoe Company</i> –Faridabad
<i>Liberty Shoe</i> –Karnal
<i>Hindustan Machine Tools</i> –Pinjore
<i>Sewing Machine</i> –Ambala
<i>Oil Refinery</i> – Panipat
<i>Maruti Industry Ltd.</i> –Gurugram
<i>Rajdoot Motorcycle</i> –Faridabad
<i>Escort Tractors and Kelvinators</i> –Faridabad
<i>Atlas Cycle</i> — Sonipat
<i>Iron and Steel</i> —Hisar, Bahadurgarh, Ganaur, Panipat
<i>Auto Tyre and Tube</i> —Faridabad, Ballabgarh, Panchkula, Gurugram
<i>Electronics</i> — Panchkula, Gurugram, Ambala, Faridabad
<i>Vegetable Units</i> —Karnal and Sirsa
<i>Sanitary Wares</i> —Bahadurgarh
<i>Drugs and Pharmaceuticals</i> — Dundahera, Gurugram

Other Facts:

- *Maximum numbers of tractors* (25% approximately) of the country are produced in Haryana.
- *One-third of sanitary-ware material* is produced in Haryana.
- *Above 50 percent of the country's cars* are produced in Haryana.
- *Railway workshop* is situated at Jagadhri city of Yamunanagar district in Haryana.
- *Iron–pipes industry* is located at Hisar and Ganaur in Haryana.
- *Goodyear Tyre production factory* located at Ballabgarh in Haryana is the prime factory. The famous Goodyear International Corporation of America looks after this factory.

- Ambala alone exports 35 percent of the country's scientific goods.
- 60 percent demand of the Boxes for cannon balls and gunpowder needed to army is supplied by Yamunanagar, while 75 per cent demand of woollen-blankets for army is supplied by Panipat.
- **Panipat**, the historical place is famous for beautiful artistic woollen carpets and handloom goods. Due to this it is known as "**City of Weavers**".
- Beside the large industries the **Small Scale industries** are also being developed in Haryana.

<p><i>Iron Almirahs, Tables and Chairs at Panipat</i></p> <p><i>Funnels of oil lamps at Ambala,</i></p> <p><i>Metallic utensils at Rewari, Panipat, Jagadhri,</i></p> <p><i>Carpets at Ambala,</i></p> <p><i>Woollen carpets and woollen blankets at Panipat</i></p> <p><i>Televisions at Faridabad</i></p> <p><i>Matchbox small industry at Jagadhri</i></p> <p><i>Leather tanning at Jind.</i></p>

- The arrangement of raw material is made by **Haryana state small industries** and by **State Export Corporation** for minor industries.
- Thread, colour and chemicals for the textile industry of **Panipat** are managed by small scale industries as well as Export Corporation of Haryana State.
- **Training centres of handicraft** in Haryana are at **Chandigarh, Madhuban, Rohtak and Jagadhri**.
- Gurugram and Bahadurgarh are the cities of **clay pots** in Haryana.
- The formation of **Haryana Financial Corporation** was done on **1 April, 1967**. The aim of this Corporation was to provide loan to those industries whose share capital is less than one crore.
- **Haryana State Industrial Development Corporation** has been entrusted the task of integrated development of large, medium and small scale industries.

<p>Factories established with the help of "Haryana State Industrial Development Corporation"</p>
<p><i>Haryana Beverage Ltd. (Beer production factory) at Murthal (Sonipat)</i></p> <p><i>Haryana Concast Ltd. at Hisar</i></p> <p><i>Haryana Minerals Ltd. at Narnaul</i></p> <p><i>Haryana Tanneries at Jind</i></p> <p><i>Haryana Television Ltd. at Faridabad</i></p> <p><i>Haryana Detergent Ltd. at Dharuhera</i></p>

- **H.M.T. factory** is situated at **Pinjore (Ambala)**.

- The *Saraswati Sugar Mill* is situated at *Yamunanagar (Haryana)*.
- *Yamuna Gas Ltd.* was established in 1973 ranks first in the production of *industrial gas*.
- Beside the *railway workshop* at *Jagadhri* there is also a *Carriage and Wagon Workshop of Northern Railway*..
- *Bharat Starch Chemical Ltd*; was established in 1938 at *Yamunanagar*. Here maize starch as well as its by products are prepared. This fulfils the necessities of different industries e.g., Cotton-textile mill, Paper mill, Foundries and Tanneries etc.
- *Haryana distillery* was established in 1969 at *Yamunanagar*.
- *Timber Market (Mandi)* at *Yamunanagar* was known as *Abdullahpur Mandi* prior to 1947. This mandi is more than 100 years old.
- *Bhiwani Textile Mill, 1937* has an important place in manufacturing *thread* and *cloth*.
- *Technological Institute of Textiles (T.I.T.)* is an important industrial unit at *Bhiwani*.
- *Cement factory* at *Charkhi-Dadri* was constructed by *Seth Ram Krishan Dalmia* in collaboration with the German Engineers. This factory was merged with *Cement Corporation of India*, a govt. of India undertaking in 1981.
- *Captive Electric Plant* was established at *Panipat* district in Haryana.
- *Oil refinery factory (I.O.C.)* started production in year 2002 at *Panipat*. This oil refinery in Panipat has been established in *Bahauli* Area.
- *Ammonia Plant* has been established at *Panipat*.
- *Hero-Honda Motorcycle factory, brass utensils industry* and *Tilla shoe industry* are at *Rewari* district

Development in Industrial Sector:

- Haryana ranks **sixth** in the country based on the *Industrial Entrepreneur Memorandum (IEMs)* and is ranks **one** in country in implementation of the *Industrial Entrepreneur Memorandum /Letters of Intent*.

Industrial Entrepreneurs' Memorandum/Letter of Intent

1. What is IEM?

Industrial Entrepreneurs Memorandum (IEM) is an application for acknowledgment of unit.

2. What is the eligibility for getting IEM?

The large scale industry having investment more than Rs. 10 crore in manufacturing sector and more than Rs. 5 crore in service sector, primarily which is outside the purview of the licensing provisions and for the items not exclusively reserved for manufacture by SSI sector have to file an application for Industrial Entrepreneurs Memorandum means IEM.

3. In which case the IEM/ LOI is required?

The promoter can file IEM in following categories:

1. To set up a new industrial undertaking,
2. To effect substantial expansion of the industrial undertaking,
3. To manufacture a new article
4. To carry on business of existing SSI units after graduating into large scale industry.

- The land was acquired for setting up of *Special Economic Zones (SEZs)*

Special Economic Zone (SEZ)

- SEZ is a specifically delineated **duty-free enclave** and shall be deemed to be foreign territory for the purposes of trade operations and duties and tariffs.
- In order words, SEZ is a geographical region that has **economic laws different** from a country's typical economic laws. Usually the goal is to increase foreign investments.
- The Special Economic Zone (SEZ) policy in **India** first came into inception on April 1, 2000.
- The **prime objective** was to enhance foreign investment and provide an internationally competitive and hassle free environment for exports.
- The **idea** was to promote exports from the country and realising the need that level playing field must be made available to the domestic enterprises and manufacturers to be competitive globally.

- Haryana is the *first state in the country* who has introduced **Labour policy** to create friendly environment and to bring cordial relations between the employers and employees.
- An extensive programme of **Chaudhary Devi Lal Adarsh Industrial city** at *Manesar* area of Gurugram is being implemented.
- For development of **Industrial infrastructure**, the state Government has designated **Haryana state Industrial Development Corporation** as a **nodal agency**.
- In order to develop **food processing based on agriculture** the state government is developing the **Food Parks** at *Narwana(Jind)*, *Saha(Ambala)*, *Rai(Sonipat)* and *Dabwali(Sirsa)*.
- Haryana has aligned its vision with the *three focus areas* of **Digital India programme** which are
 - *Digital infrastructure as a utility to every citizen,*

- Governance and services on demand, and
- Digital empowerment of citizens.
- Haryana currently accounts for 6.8 percent of employment in the IT sector.
- A **High-tech Technology park** is being established at Gurugram.
- Haryana has come out with “**Enterprises Promotion Policy**”(EPP), 2015

Pillars of EPP
Ease of doing business
Enhancing competitiveness by reducing cost of doing business
Balanced regional growth
Focus on MSME sector
Constant engagement with industry
Proper implementation mechanism with redressal grievance.

Recent developments:

- Setting up of **National Institute of Solar Energy(NISE)** in **Gurgaon**, as a **headquarter** for **International Solar Alliance(ISA)** which is partnership of solar resource rich **121** countries, was announced by Prime minister **Mr. Modi** and French president **Mr. Hollande**.

International Solar Alliance (ISA)

- ISA is an alliance of more than **121** countries, most of them being *sunshine countries*, which lie either completely or partly between the *Tropic of Cancer* and the *Tropic of Capricorn*.
- The primary objective of the alliance is to work for efficient *exploitation of solar energy* to reduce dependence on fossil fuels.
- This initiative was first proposed by Indian Prime Minister Narendra Modi in a speech in November 2015 at Wembley Stadium, in which he referred to sunshine countries as *Suryaputra* ("Sons of the Sun").
- The alliance is a *treaty-based inter-governmental organization*.
- Countries that do not fall within the Tropics can join the alliance and enjoy all benefits as other members, with the exception of voting rights.

- **Walmart India Pvt Ltd** plans to open chains in Haryana.
- Haryana have made investments in the infrastructural facilities such as **Special Economic Zones(SEZs)**, **Kundli–Manesar–Palwal(KMP) global corridor** and **DELhi Mumbai Industrial Corridor(DMIC)**.
- **International centre for automotive technology** has been setup at **Manesar** as part of “**National Automotive Testing and R&D Infrastructure Project(NATRip)**”

- Haryana is the *first state* to implement *State Wide Area Network (SWAN)* for voice, data and video transmission.
-

Minerals:

Main Minerals
Limestone - Mahendragarh
Slate - Mahendragarh and Nuh (Mewat)
Shora - Hisar, Karnal and Gurugram
Lime - Rohtak
Gravel - Faridabad
China-clay - Gurugram
Iron - Mahendragarh
Chalk soil - Gurugram
Marble - Mahendragarh
Asbestos - Mahendragarh

Power Resources:

- Haryana has limited availability of natural power resources.
- There is very hydro power generation in the state.
- Even the coal mines are located far away from the state.
- There is very limited forest area
- Winds prevailing in the state are not sufficient to exploit them for power generation
- Solar intensity is higher but land area limitation does not allow it to harness the full potential.
- Therefore the state has been dependent upon the limited thermal energy in the state and the hydropower from jointly owned projects.
- A revolutionary work of supplying electricity to each village of the state was started under the leadership of Chief Minister Bansi Lal and by 1970 electricity was supplied to each village.
- The aim of *100% rural electrification was first completed by Haryana.*
- The *Thermal power stations* is situated at *Faridabad, Panipat* and *Yamunanagar.*
- The per capita consumption of electricity increased from **700** units in 2006-07 to **1442.90** units in 2014-15.
- The State has **renewable energy** based installed power generation capacity of 165 MW in 2014-15.

Renewable energy is energy that is collected from renewable resources, which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat. Renewable energy often provides energy in four important areas: electricity generation, air and water heating/cooling, transportation, and rural (off-grid) energy services.

Three Big Projects in Haryana
Panipat Thermal Extension Project
Yamunanagar Thermal Project
Hisar Thermal Project

Transport

- Transport and its means are the indicators of development of any nation as well as of state.
- If the route of transport is accessible and developed, this will provide the better environment for trade affairs, through which the economic development of that place will be better.
- Mainly there are two means of transport in Haryana (i) Roads (ii) Rails.

Roads:

- Roads are the basic means of communication throughout the state.
- Haryana state has a good road network. There are **29** national highways with total length of **1,461 km** and many state highways with total length of **2,494 km**.
- One of the oldest and longest National highway - Grand Trunk road passes through five districts of Haryana.
- Routes has the distinction of linking all the villages through metalled roads.
- In 1966 at the time of formation of Haryana state, there was only 5100 km length of metalled roads.
- The total length of roads in the state is 23,684km.
- The nationalization of passenger transport in the state was done in 1972.
- 8 new national Highways have been sanctioned by the centre to pass through the state of haryana.

List of State Highways in Haryana

Highway no.	Route	Length(km)
1	Jagadhri-Bilaspur-Sadhaura Naraingarh Raipur Rani Road	64.1

2	Surewala Chowk to Fatehabad	47.91
4	Kala Amb Sadhaura Shahbad Thol	75.5
5	Saha to Ambala	15.14
6	Saharanpur Radaur Pipli Pehowa Chika	103.64
6-A	Jagadhri-Paonta	4.9
7	Karnal Ladwa Shahabad	59.25
8	Kunjpura Karnal Kaithal Khanauri	96.05
9	Kaithal to Pehowa Patiala	60.25
10	Gohana Jind Barwala Agroha Adampur Bhadra	135.82
11	Meerut Sonapat Gohana Safidon Assandh Kaithal Patiala	183.71
11-A	Deoban Naguran	30
12	Karnal Assandh Jind Hansi Tosham Sodiwas	192.32
13	Gurgaon-Sohna-Nuh-Nagina(Badkali Chowk)-Ferozepur Jhirka-Alwar	137.4
14	Panipat Safidon Jind Bhiwani Loharu	177.21
15	Shahjahanpur-Rewari road.	21
15-A	Jhajjar Farrukhnagar Gurgaon	43.03
16	Sanauli Panipat and Rohtak Bhiwani	62.28
16-A	Gohana Lakhan Majra Meham Chang	68.91
17	Nizampur Narnaul Mohindergarh Dadri Bhiwani Hansi Barwala Tohana Munak.	199.74
18	Rohtak Kharkhoda Delhi Border	41.1
19	Siwani Singhani road	49.5
20	Murthal Sonapat Kharkhoda Sampla Jhajjar Jahajgarh Chhuchhakwas Dadri Loharu	156.59
21	Budhlada Ratia Fatehabad Bhattu Bhadra	65.51
22	Bahadurgarh Jhajjar Kosli	77.11
23	Sardulgarh-Sirsa Ellenabad	68.48

24	Rewari Dahina Kanina Mahendergarh Satnali Loharu	92.45
26	Gurgaon Pataudi Rewari Narnaul Singhana	119.88
31	Saha to Shahabad	17
32	Sirsa-Rania-Dabwali road	70.43

National Highways in Haryana

National Highway 1 (India, old numbering)	National Highway 71 (old numbering)
National Highway 2 (India, old numbering)	National Highway 148B
National Highway 8 (India, old numbering)	National Highway 709
National Highway 10 (India, old numbering)	National Highway 907

Expressways

Faridabad-Noida-Ghaziabad Expressway
Himalayan Expressway
Pathankot Ajmer Expressway

Rail :

- *Ambala, Panipat, Jakhal, Jind, Hisar, Rohtak, Faridabad, Bhiwani and Rewari* are the important railway stations.
- In *Jagadhri* city of Yamunanagar district, there is a *Railway workshop*.
- The total length of Rail route in Haryana is 1,630 km (31 March, 2015).

Air travel :

- The facility is available between *Delhi* and *Chandigarh*.
- The Civil Aviation Department has 5 *Airstrips* at *Pinjore, Karnal, Hisar, Bhiwani* and *Narnaul*.
- Three flying training centres of *Haryana Institute of Civil Aviation (HICA)* are established at *Hisar, Karnal* and *Pinjore*.

Census of Haryana

Description	2011	2001
Actual Population	25,351,462	21,144,564
Male	13,494,734	11,363,953
Female	11,856,728	9,780,611
Population Growth	19.90%	28.06%
Percentage of total Population	2.09%	2.06%
Sex Ratio	879	861
Child Sex Ratio	834	819
Density/sq km	573	478
Density/sq km	1,485	1,239
Area(sq km)	44,212	44,212

Area (sq km)	17,070	17,070
Total Child Population (0-6 Age)	3,380,721	3,335,537
Literacy	75.55 %	67.91 %
Male Literacy	84.06 %	78.49 %
Female Literacy	65.94 %	55.73 %
Total Literate	16,598,988	12,093,677
Male Literate	9,794,067	7,480,209
Female Literate	6,804,921	4,613,468