

Life in nature is possible only because of water. All the activities of living organisms including man are possible due to water. Water is used for drinking, household work, irrigation, boating, electricity production, recreation and in industries etc. The sources of water which are useful for humans or have the possibility of usage are called water resources. The main sources of water in Rajasthan are lakes, rivers and constructed over them, dams, canals, ponds, wells and tube wells. Let us study in this chapter about water resources and drainage system of Rajasthan in detail.

Drainage System:-

The special system of water flow formed by river and its tributaries is called a Drainage System. It is affected by landforms and its geological structure. We know that it is the nature of water to flow towards its slope. It is believed that 3000 years back Satluj, Yamuna and prehistoric Saraswati Rivers flowed from Rajasthan and drained in Arabian Sea near Baruch, Gujarat. But because of internal disturbances in earth and changes in climate, this ancient river Saraswati which nourished the Vedic culture became extinct.

Do you know

The small rivers which carry the water of their region to add to big rivers are called tributaries

Water dividing line: - The high land between two drainage system which divides rain water in two different directions is called water dividing line like – Aravali mountains of Rajasthan.

Drainage System of Rajasthan:-

The drainage system of Rajasthan is divided into three divisions.

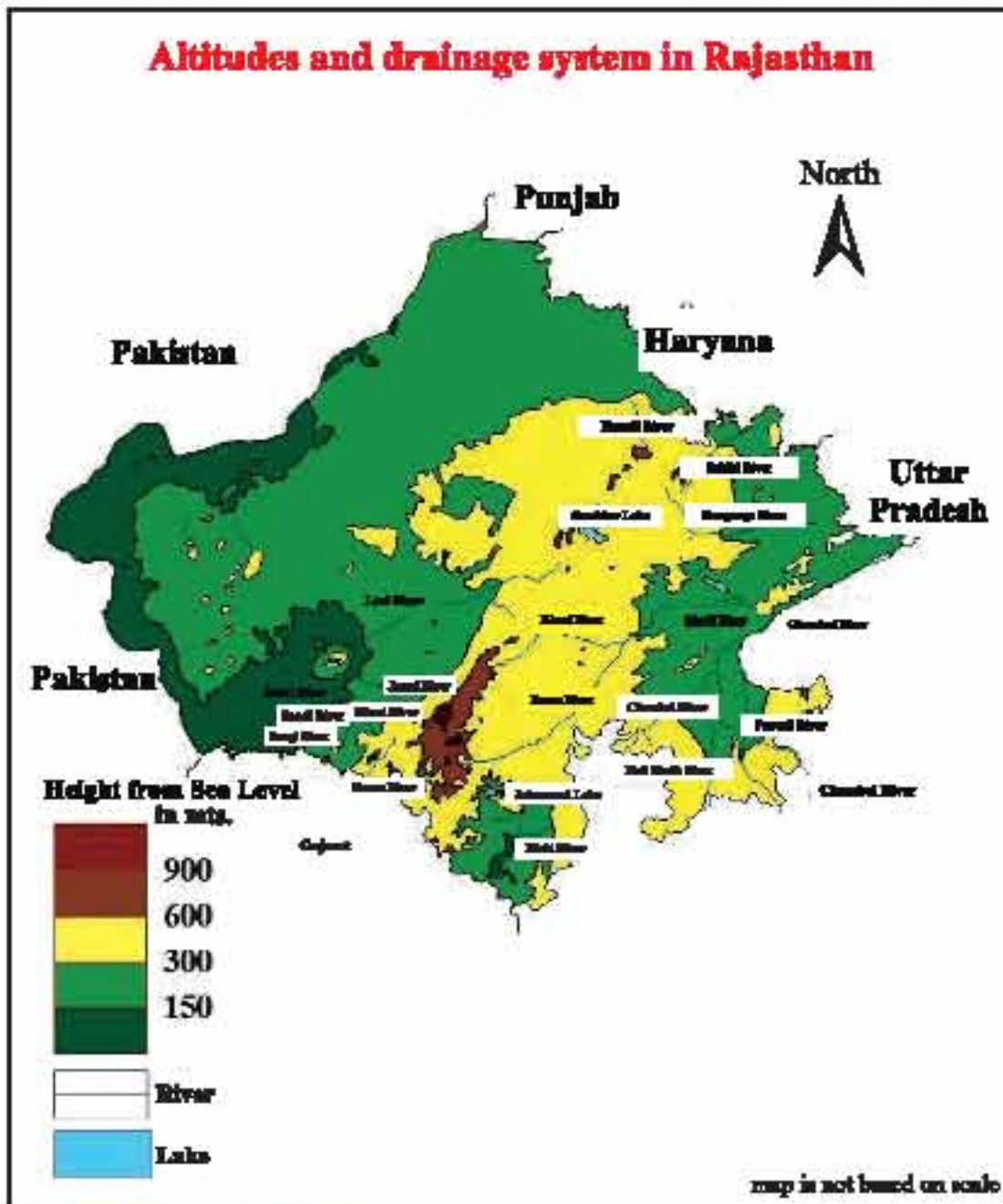
1. Drainage System of Bay of Bengal:- The river Chambal, Kalisindh, Parvati, Bemas, Bedach and their tributaries originating from the eastern side of Aravali mountains and draining in Bay of Bengal, forms the Bay of Bengal Drainage System.

2. Drainage System of Arabian Sea: - Mahi, Luni, Sabarnati, western Bemas and their tributaries originating in western parts of Aravali Mountain and draining in Arabian Sea forms the Arabian Sea Drainage System.

3. Internal Drainage System: - The river which extinct on land or drain its water in a lake is called internal or underground drainage system river. The Ghaghar, Banganga, Kantali, Sassi, Ruparull, Menda etc rivers are rivers of Internal Drainage System.



Altitudes and drainage system in Rajasthan



The Main Rivers of Rajasthan:-

Chambal River:- This river originates in Janapav of Vindhyaachal mountains in Madhya Pradesh. This is the longest river of Rajasthan, and the only river which flows throughout the year. This river enters in Rajasthan at Bhainsroadgarh and flows through Kota, Bundi, Sawai-Madhopur, Karoli and Dholpur and joins the Yamuna River in Uttarpradesh. The main tributaries of this river are Banas, Beruch, Kothari, Kalisindh and Pravati etc. 'The industrial city' Kota, is located on the bank of this river.

Banas River:- This is the tributary of Chambal river. It originates in Khamnour hills in Rajasthan. It flows in Rajasthan, Chittorgarh, Bhilwara and Tonk and joins with Chambal River at Rameshwar in Sawai Madhopur. The catchment area of the river is the maximum in Rajasthan and is the longest river flowing solely in Rajasthan. Its length is approx 480 kms. The juncture of Banas, Bechad and Menaal River, known as Triveni is situated in Bigod (Bhilwara). Tonk and Sawai Madhopur are located on the bank of this river. Other tributaries of Banas are Kothari, Gambhiri, Kahri, Morail etc.

Luni:- This river originate at the confluence of two streams Saraswati and Sagarnati near Govindgarh of Ajmer district . It flows in Ajmer, Nagaur, Pali, Jodhpur, Barmer, Jallor and drain in Bay of Kaccha. The water is fresh till Balotara of Barmer after that its water becomes salty. The Jojari, Bandi, Jawai, Mithari, Khari, Sukari, Sagi, Guhiya are its main tributaries.

Mahi:- Its origin is at Amroru in Vidhyschal mountaion in Madhya Pradesh. This river flows in Banswara and Pratapgarh district and drain in Bay of Khambat. The Mahi Bajaj Sagar dam was built on this river in Banswara district. The main tributaries are Som and Jakhm.

Banganga:- It originates from Beirath hill of Aravali in Jaipur. The water of this river flows underground in Ghana Bird sanctuary, Bharatpur and forms wet land there. It is also known as 'Arjun ke Gangi'.

Ghaghgar:- It originates from Shivalik range of Himalayas in Himachal Pradesh. It enters in North Rajasthan in Hanumangarh and goes underground in Shriganganagar. This river is believed to be a tributary of ancient Saraswati River. This is the longest river belonging to the internal drainage system of Rajasthan.

Main River Valley Projects of Rajasthan:-

Dams built on rivers fulfill many purpose like electricity generation, irrigation, drinking water, plantation, increase in level of underground water, flood control, check soil erosion and tourism, hence these are known as multipurpose projects. Jawahar Lal Nehru, the first Prime Minister of India named these river valley projects as 'Temples of Modern India' after observing their importance. The description of main River valley projects of Rajasthan is as follows.

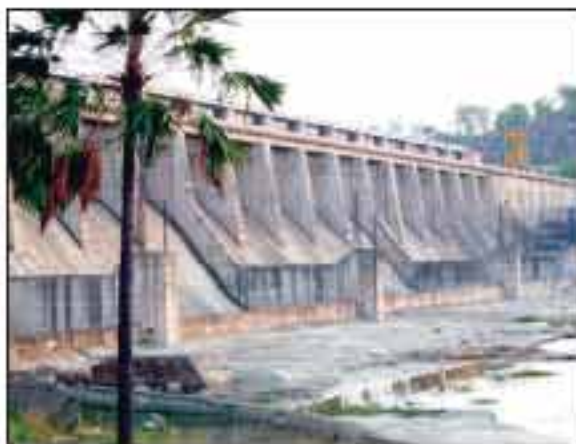
Do you know?

The dam built to change the natural flowing direction of river for irrigation is called 'Barrage'.

The part of the main canal, the water of which is not used for any purpose is called feeder.



Chambal Project:- It is combined project of Rajasthan and Madhya Pradesh. Four dams are built under this project. One is Gandhi Sagar dam is Mandasaur district of Madhya Pradesh. The other three are in Rajasthan namely Rana Pratap Sagar in Chittorgarh district, Jawahar Sagar and Kota Barrage in Kota districts. This project provides irrigation and hydroelectricity to both the states.



Rana Pratap Sagar dam



Mahi Bajaj Sagar dam

Mahi Bajaj Sagar Project: - The project is situated on Mahi river in Banswara. It is combined project of Rajasthan and Gujarat. Drinking water and irrigation need is fulfilled by this project. Hydroelectricity is also produce in this project.

Bisalpur Project:- The project is established mainly for supplying drinking water on river Banas at Bisalpur village near Todarai Sing City in Tonk district of Rajasthan. The water is supplied to Jaipur, Ajmer and Tonk districts of Rajasthan.

Sardar Sarovar Project:- This combined project of Gujarat, Madhya Pradesh, Maharastra and Rajasthan was constructed on Narmada river in Gujarat. South Western Rajasthan i.e. Barmer and Jalore are supplied water for irrigation and drinking through a canal from this project.

The other developed river valley projects in Rajasthan are Jawai Project on Jawai river in Pali, Som-Kamla-Amba project on Som river in Dungarpur, Mangi Wakal in Udaipur and Jakham project on Jakham river in Pratapgarh.

Let us do

1. List the advantages of dams on rivers.
2. Is there any dam project in your district? If yes, then collect information on that.
3. Locate the main rivers on an outline physical map of Rajasthan.

Main Canals:-

Gang Canal:- Water supply through canal system had started in Rajasthan before independence. The then king of Bikaner, Maharaja Ganga Singh build a dam near Ferozpur in Punjab on Satluj River and from there in 1927 AD a canal was built to supply water in western Rajasthan. This was the first canal of Rajasthan. At present irrigation in Sriganganagar is facilitated by this canal.

Indira Gandhi Canal:- Irrigation Engineer Karwar Singh of Bikaner in 1948 was the first to advice the construction of this canal for providing water in desert regions of Rajasthan. After the approval of central government in 1952, work started with the construction of a dam named Harike Barrage on the meeting point of Satluj and Vyas rivers in Punjab. From Harike Barrage to Masitawali in Hanumangarh is a feeder canal of 204 km. The main canal is 649 km in length and its distributaries are more than 8000 km in length, which irrigate about 19 Lakh hectare area. The ending point of this canal at present is at Gadra road in Barmer. This largest canal of Asia is also known as 'Meruganga.'

If this canal is extended upto Kandla port in Gujarat then navigation of small ships and boats is possible in the canal. The slope of Thar Desert is towards west and hence many lift canals are made to facilitate water in eastern parts of Rajasthan. Because of Indira Gandhi canal system, agriculture development, check on desertification, control on flood and famine, development of animal stock, fisheries and tourism have been possible.



Indira Gandhi Canal & command area



Water Flow in Indira Gandhi Canal

Let us do:

Answer the following question by observing the map of Indira Gandhi canal.

1. Which two rivers meet near Harike Barrage.
2. Which districts are provided with irrigation facilities by Indira Gandhi canal?
3. Mark Indira Gandhi canal in an outline map of Rajasthan.



Bharatpur Canal: - This canal is drawn from western Yamuna canal. Only Bharatpur district benefits from this canal in Rajasthan.

Besides these canals various small dams, aniket, ponds, wells and tubewells are used for irrigation in Rajasthan. At present drip-irrigation and sprinkle methods are also being developed for irrigation.

Let us do

Is there any canal in your district or in nearby areas? If yes collect information about it and list its advantage.

Water conservation and Management: -

Normally conservation means 'to preserve for future', that is the optimal use and management of the resources so that their misuse and unnecessary damage is prevented, is known as Resource Conservation. Water is such a natural resource on which not only human but vegetation and the whole living world is dependant. At present because of industrial economical environment, rising consumer culture, rise in population growth, rise in irrigated land, water exploitation has also increased rapidly. Therefore, at global and local level, there is a need to conserve fresh water in all countries so that our coming generation can get pure water.

The Methods of water conservation:-

For water conservation it is necessary that, every citizen, society and administration unitedly take a step forward. The main steps include not disposing off domestic and industrial waste in water bodies, not to wash and bath near drinking water sources, and to remove weeds of water. By redistribution of water that is by making available water through canals from areas of high rainfall to areas of low rainfall favourable conditions can be created for human life and industries and thus regional and social disparities can be reduced. Along with these, efforts for water storage, population control, use of upgraded means of irrigation, increase in forest area, conscious use of underground water and water redistribution can improve water scarcity and depletion problem.

In almost every part of Rajasthan different water resources are found. In ancient time these water resources provide water to the people. They were well maintained. Various ponds, lakes, wells and stepwells found in different districts of the state are examples of this. The kings of that time adopted many methods for water reserve and water conservation. A brief knowledge of this kind of work done by the rulers of Udaipur is illustrated below.



Udaipur-Historical water Management System: A Study

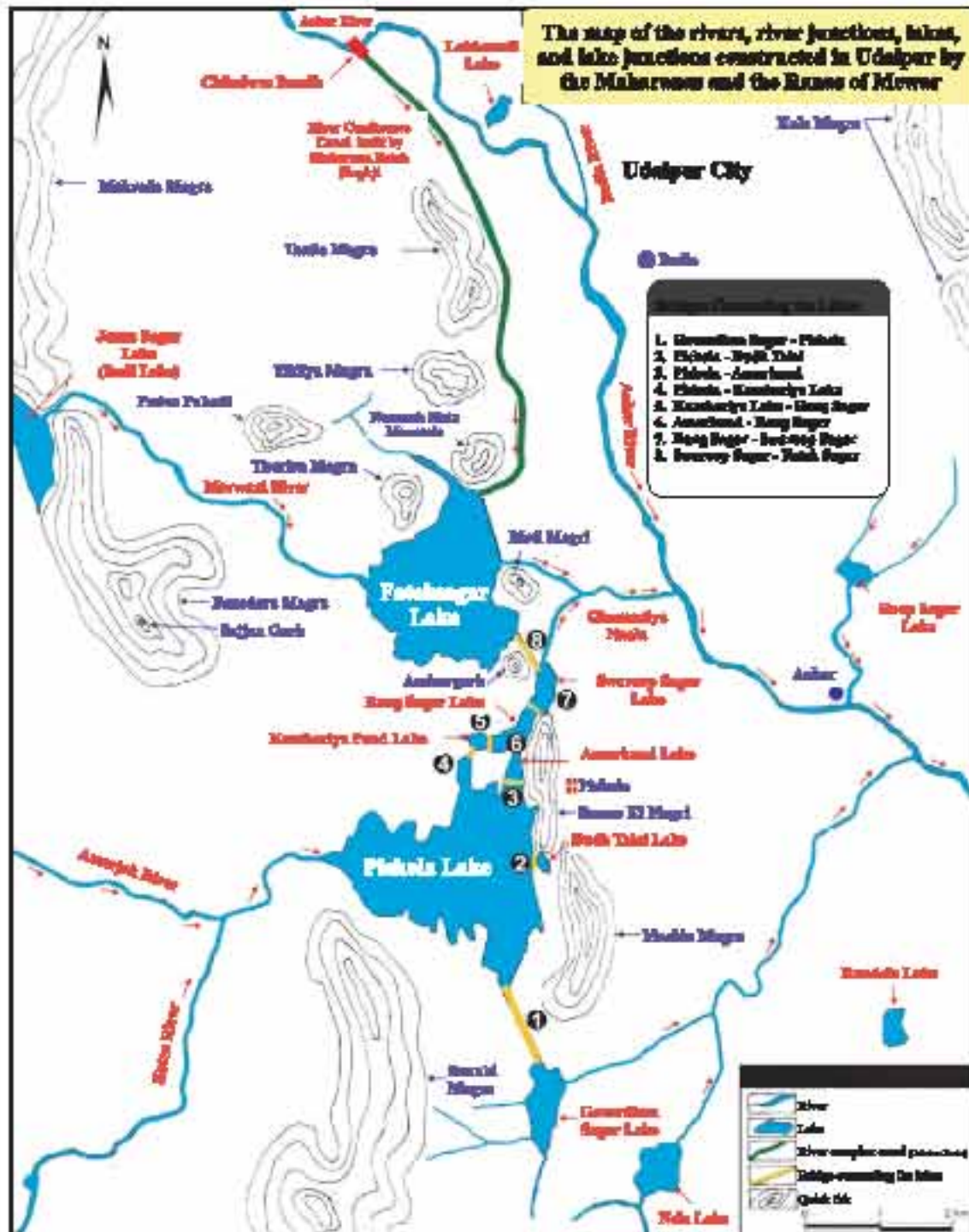
The idea of water conservation is very old in Rajasthan. The Ranas (kings) of Rajasthan built many lakes. The best example is Jaisamand Lake, which was built by king of Mewar, Maharana Jal Singhji from 1687 to 1691 AD. on Gomati river, which is the largest man-made lake of fresh water in the world. One of the oldest examples of water conservation by diverting and connecting rivers and inter connecting lakes can be seen in Mewar.



6 km in west of Udaipur city, near Chikalwas village, Maharana Fatehsingh got a dam constructed on Ayad River to divert the excess water in rainy season to lake Fatehsagar, for which Chikalwas canal was built. By this canal the water of Ayad was carried to Fatehsagar 118 years back. The kings of those times had done admirable job in public welfare by conserving and managing water on local level, by constructing lakes one after the other and connecting the rivers in a valley spreaded in 470 square kilometer area. This system is still functioning efficiently. From the point of view of water management the construction of Govardhan Sagar, Dudh Talai, Pichhola Lake, Amar Kund, Kumaria pond, Rang Sagar, Swaroop Sagar and Fateh Sagar are best examples in world. When these lakes are full in rainy season their water level becomes same and water mixes which each other. The various ponds in Udaipur basin are best examples of water management used for irrigation, drinking water and tourism.

Maharana Jai Singh I artificially diverted the river flow and gave it stability. In Ubhayeshwar, a famous religious destination of Mewar, a seasonal river was diverted to drain in Morwani River. Thus the water of Ubhayeshwar was delivered to Jansagar and Lake Fatehsagar. This task of draining the water of Ubhayeshwar in Morwaniya River was done in between 1670 to 85 A.D.





River connection and lake connection in Udaipur (Junction)

Let us do

Was any lake, canal, well or any other water source built by rulers of ancient time in your district? Collect information about its present position and other characteristics and discuss in your class.

Glossary

Drainage	:	The flow of river
Conservation	:	To preserve
Waste	:	of no use
Remains	:	left over

Exercise

- 1) Choose the correct options:
 - a) Banas and Beruch are tributaries of which river.
(a) Chambal (b) Luni (c) Banganga (d) Mahi ()
 - b) Som Karna Amba project is situated in.
(a) Barmer (b) Dungarpur (c) Udaipur (d) Kota ()
- 2) Fill in the blanks.
 - 1) The water of _____ River forms wet land in Ghana Bird sanctuary.
 - 2) _____ is the largest canal system of Asia also known as 'Meruganga'.
 - 3) _____ Lake is considered as the largest fresh water manmade lake in the world.
 - 4) Pt. Jawaharlal Nehru called River valley projects as _____.
- 3) What do you mean by water dividing line?
- 4) Write the names of main tributaries of Banas.
- 5) Write the names of main river valley projects of Rajasthan.
- 6) Write a brief essay on Chambal project.
- 7) What do you mean by water conservation? How can you conserve water?

