

The Thar Desert



If you have water, you have everything else. And if you don't have water, what do you do?

Let's look at one of the driest parts of our country. This is the Thar Desert in western Rajasthan. Throughout the whole year it gets very little rainfall.

The Luni is the only big river to flow in the western part of Rajasthan. And even in the Luni, water does not flow throughout the year. However, in the large region northwest of the Luni there is not a single river to be seen.

Find the Thar Desert (shaded grey) in this map.

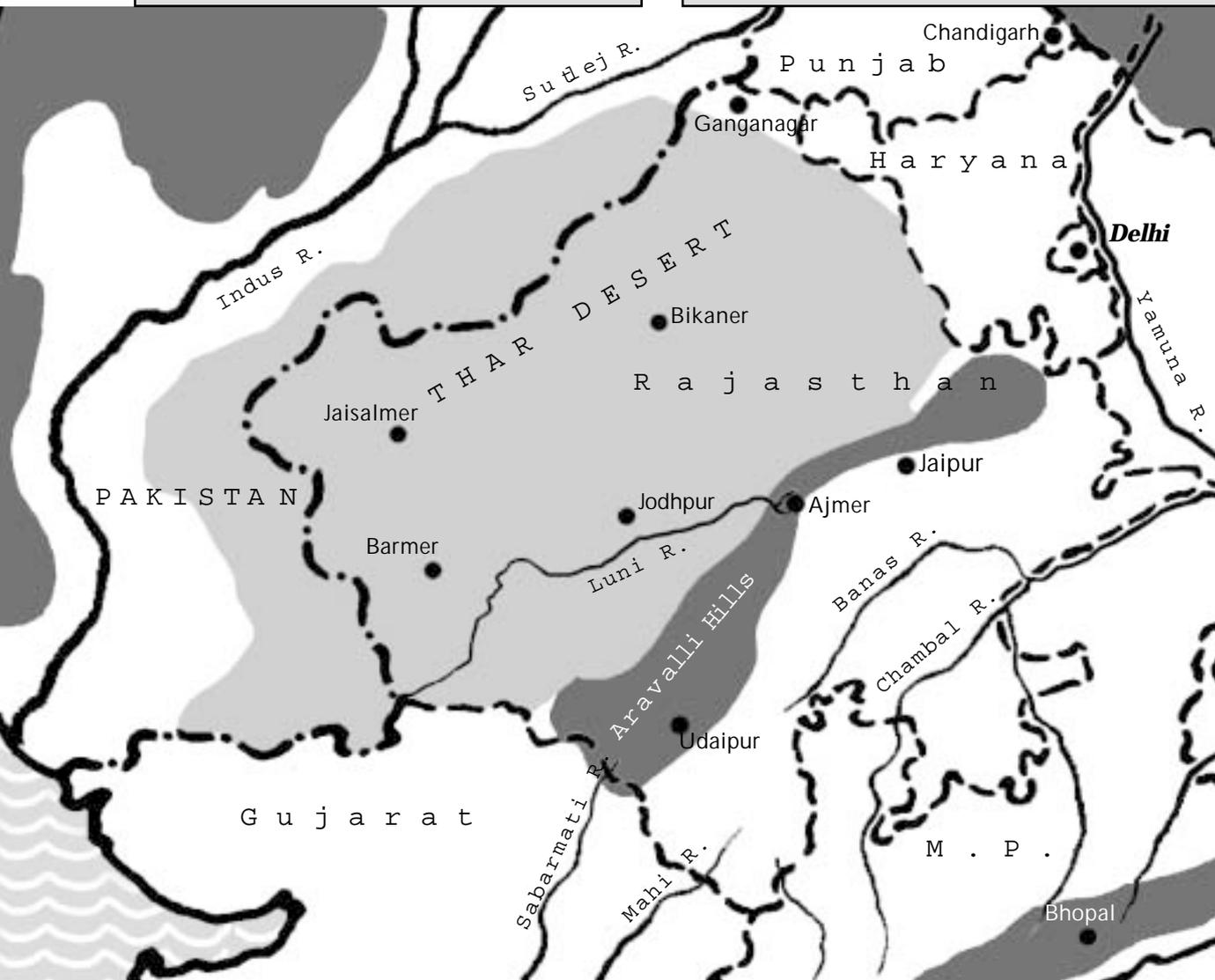
In which countries and states is the Thar Desert located?

From which hills does the Luni River begin?

If an area has no rivers, what does this imply? Why doesn't it have rivers? What kind of place must it be?

Is the capital of Rajasthan located in the Thar Desert?

In the part of Rajasthan to the east of the Aravalli Hills, there are many small rivers. What are their names?



Rainfall and Temperature

Look at the map showing annual rainfall in India. You will find that as you go from the east to the west in Rajasthan, the rainfall decreases. This is also shown in the two rainfall graphs here.

Look at the annual rainfall map and tell how much it rains in each of the following areas:

- The area to the east of the Aravalli hills*
- The Aravalli Hills and the area to their west*
- The extreme west of Rajasthan*

For comparison, tell how much it rains where you live.

Using the graphs on the right, estimate how much is the annual rainfall in Jaipur and Jaisalmer and see if this agrees with what is given on the annual rainfall map.

When is the monsoon in Jaipur and Jaisalmer?

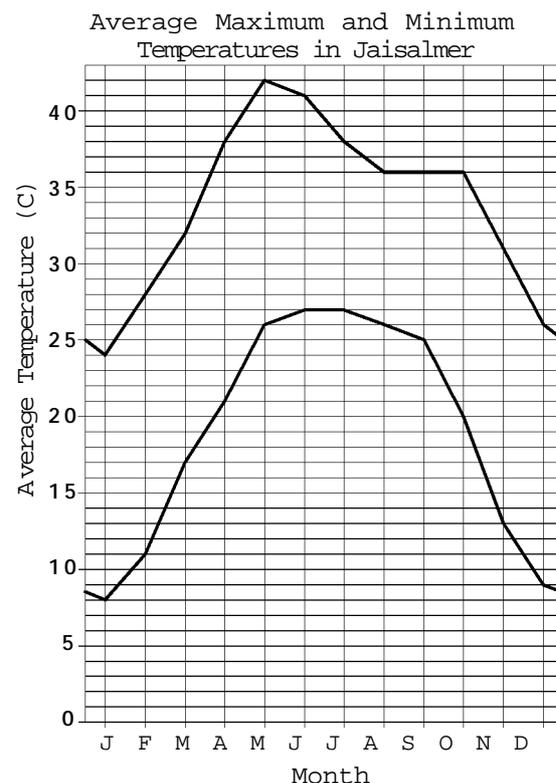
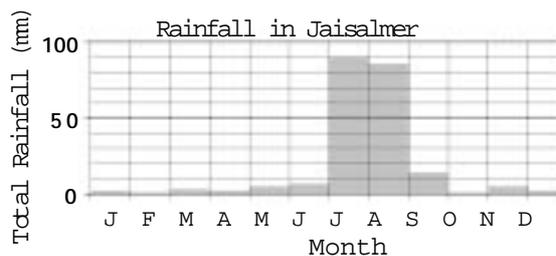
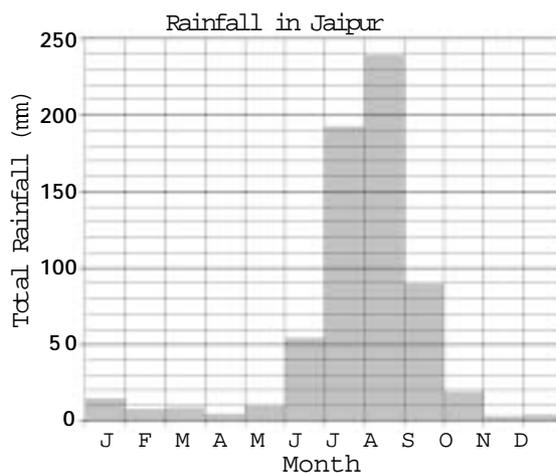
Not only does it rain very little in the Thar Desert, but it also happens that sometimes many years pass without a single drop of rain. After many years, it may suddenly rain very heavily, leading to flash floods in dry rivers and nallahs. But this water dries up before long. There is never enough water to enable rivers and nallahs to flow for a long distance.

Look at the graph on the right. Which are the hottest and coldest months in Jaisalmer and how hot and cold do they usually get?

Are the hottest and rainiest periods in Jaisalmer at the same time of the year?

Does it get much cooler during the monsoon than during the summer in Jaisalmer?

Why is it usually cooler in August than in May?



Vegetation

Because of the absence of water, one can go for many kilometres without seeing a single tree in the desert. But in most areas there are many kinds of small thorny bushes and grasses. And here and there you might be able to spot a khejdi (Kjāḍl) tree.



Living in the Desert

Come, let's find out how people live in such a dry place.

In many Indian languages, the word for desert is marusthal – literally meaning, a place of death. This is because the lack of water can kill people, animals and plants. During times of severe drought, people and animals may have to face death if they do not migrate.

Look at a map to find out whether the population is denser in the eastern or western part of Rajasthan. Explain why the density differs.

In Jaisalmer Tehsil, half the villages are very small, with less than 500 people living in each one. The villages are also sparsely scattered across dry regions.

Sheep and Goat Rearing

Villagers in the Thar rear a large number of sheep and goats and sell them for their meat. Their wool is also collected and sold. During the monsoon, even with a little bit of rain, quite a bit of grass springs up in the desert. Especially sevan grass, which is very good fodder for the animals. During the times when water is scarce they also eat thorny bushes and leafy branches from khejdi trees.

In big cities such as Delhi, Mumbai, and Jaipur, the demand for meat is always increasing. The animal-hides are also used for leather, which is one of our country's most important exports. India has the highest total number of cattle, buffaloes, sheep, goats, and pigs of all the countries in the world. Rajasthan and West Bengal produce the most sheep and goats in India. Animal rearing thus remains an important occupation for the people of the desert.

Grazing sheep in Rajasthan



Crops

Due to the shortage of water very few crops are grown in the Thar Desert. If people somehow or other manage to get a single crop in a year, they consider themselves lucky. In some parts of the Thar, bajra can be sown in the rainy season. It is one crop that can grow in sandy soil without too much water.

Bajra is ready to harvest three months after it is planted. Look at the graph on page 195 and tell when bajra would be harvested in the area around Jaisalmer.

After bajra is harvested, the fields lie fallow till the next rains. With just one small bajra crop, it is certainly not possible for a family to manage for the whole year! Hence, people depend a lot on sheep and goat rearing.



Rainwater Harvesting

During the monsoon people have to make special arrangements to collect rainwater. There will be no other source of water for the rest of the year.

In many houses there are pucca tanks in the middle of the courtyard, to collect rainwater. The rain that falls on the roof of the house is drained straight into the tank. Then, for months this water is used with great care and economy for both the household and the animals. In many places people sit on a charpai to have a bath and the bath water is collected in a vessel placed directly below the charpai. It is used in cleaning the house, and given to the animals to drink. People scrub their utensils with dry sand to clean them - not just to clean them, but to make them shine!

Rainwater also collects in ditches and ponds in the desert. From these small ponds, water seeps into the sand. In order that this seeping water may not be lost, people dig small wells (called kuian or berian) that are 25-30 feet deep, all around the pond. Water seeping from the pond collects in these small wells. Months later, after the water in the ponds has vanished, people can get water from these wells.

Where there are no natural ponds or ditches, people may dig pucca tanks on the lower end of slopes so that the rainwater from all around will collect there.

These arrangements for collecting and storing rainwater are very important because normally in the desert, ground water is found only very deep underground. Thus, it is difficult to get water from wells. Even very deep wells may dry up at times. Also, in some areas well water is saline.

Many villagers have to go many kilometres to get water. In some places women and children have to walk for miles with pots on their heads. In other places water is carried on donkeys or camels.

What is meant by 'rainwater harvesting'? Can rainwater be 'harvested' like crops are harvested?

You read about the arrangements made for saving water in the desert. How do people save water in your area?



Getting water from a well

Camels

Camels are very well suited to live in deserts. They can go for many days without drinking water, especially if they get some fresh grass or other green leaves to eat. They are also good at resisting heat.

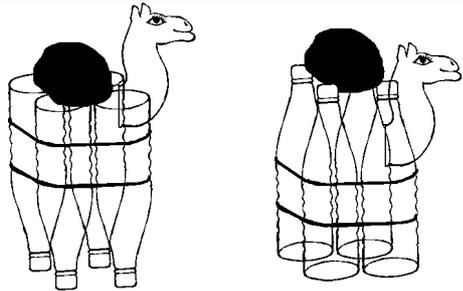
People need to keep their bodies at a constant temperature all the time. When people get hot, they sweat in order to cool their bodies by evaporation. Thus in hot weather you need to drink more water in order to replenish what you lose through sweat.

But camels can function at a wide range of body temperatures. Their bodies can go below normal at night and then rise by 6 or 7°C during the day. Thus, they don't need to sweat so much. They also don't lose too much water through urination (their urine is highly concentrated). They can survive even when a lack of water causes them to lose as much as 30% of their body weight. (A person would be on the verge of death after losing only 10% of their weight due to water loss.)

When camels find water, they can drink as much as 100 litres – and they can drink all that in as little as 7 or 8 minutes!

What do they do with so much water? It gets combined with other substances from their fodder to make fat. Much of this fat is stored in their humps. That way the fat also serves as a good insulation from the heat of the sun. As needed, the fat gets broken down to supply the camels with energy and water.

Another thing that makes camels well suited to the desert is their feet. Have you ever tried to run in soft sand? It's difficult because your feet sink deep into the sand at every step. Camels have wide, padded hooves that do not sink too deep in the sand. This, combined with their long legs allows them to move quite fast across the sand. Good camels can walk up to 16 kilometres in an hour on sand.



Experiment: Why don't camels' hooves sink deep into sand?

Make two models of camels – one with small pointed feet, and the other with large, flat feet. The models don't have to look exactly like camels – they could look like the ones shown here. Put them on soft, dry sand and see which one sinks in further. (Make sure both models are the same weight.) Then write down what you did, what happened, and why you think it happened the way it did.

Migrating Shepherds

After the bajra is cut, its stalks are left standing in the fields so that sheep can graze on them. By the end of November the sheep have gotten fat on sevan grass and bajra stalks. They have also grown a lot of wool, especially in years when the monsoon is good.

So everyone gathers their sheep together and gets them sheared. The sheep are washed before shearing and if any thorns are stuck to their wool they are carefully removed. What a lot of work! Still, it is worth the trouble because well-cleaned wool fetches a better price from the traders who go from village to village buying up the wool.

Soon the fodder around the village begins to get scarce. There is not enough vegetation to allow many sheep and goats to graze all year round. What will the animals eat during the winter and the summer? The shepherds get ready to migrate in search of fodder. Migration is an old tradition and the shepherds have fixed routes where they know they will be able to find fodder as they travel from place to place. The map on the next page shows the states that surround Rajasthan. The arrows show the usual migration routes used by the shepherds of Jaisalmer and Bikaner.

Sevan grass

Which areas of different states do sheep herders visit? Look at the map on the right and tell.

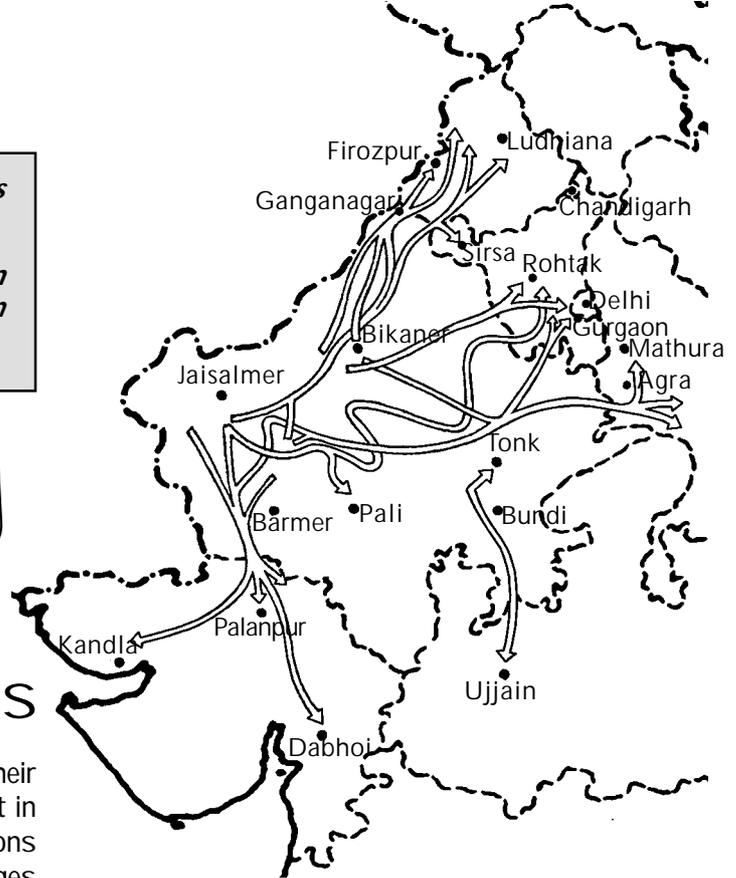
Why is sheep fodder available for the sheep in these places? How are these areas different from the Thar?

Come, let's join a group of about 50 shepherds from two villages in Jaisalmer Tehsil, and see what happens as they migrate from place to place, herding sheep.

A Journey with Some Shepherds

In some parts of Rajasthan people only take their animals out if there is a severe drought. But in our villages, we go every year. One or two persons from almost all the households of both villages are leaving with their sheep and goats. Most of us are men, but a few women and children are also coming. Most of the women, children and elderly people are staying at home.

We are leaving with 6,000 sheep and 22 camels. Some families might have 70-80 sheep, others may have 100-200 sheep and some even have 300 sheep. Those families who have only 40-50



sheep are not going out this year. They will roam over nearby places to graze their sheep.

After many days of preparation, everything has been loaded onto camels and we are ready to begin our long journey. We set off on foot, herding the sheep along as we go. Although the sheep are healthy, they are looking thin only because they were just sheared. They are quite a sight to see - moving along in a huge herd spread across the land.



Winter Days

The areas to the east get more rain, so that's where we're going. As we go along, we start seeing more grass and more trees of khejdi and babool. We cut small branches from these trees to feed the sheep.

After each day's walk, when evening descends, we pitch camp on a field or anywhere in the open. It's getting cold now. We unload everything from the camels and prepare our food. After a long day's walk, we're all hungry. We light the cooking fires, using some wood we have collected along the way. We make dal and rotis of bajra, and eat them with chillies and onions. Then we settle down in our quilts for a night's sleep.

On getting up in the morning we have tea made with sheep's milk, and then again we have rotis of bajra. After finishing our morning meal, we pack up and set out again on the day's journey.

There is more land under cultivation here in the eastern part of Rajasthan. We graze the sheep on the stalks that are left standing in the bajra fields after the harvest. They provide plentiful fodder.

The Sheep Have Problems

There are many problems that we have to face on our journey. After having been travelling for almost a month now, the sheep are beginning to tire. In some of the places we passed through, we were not able to get good fodder. Even finding drinking water can be difficult at times. Now it's getting very cold, and the sheep are beginning to fall ill. Our money and supplies are also getting low. Many people are thinking of borrowing money. There's a small town not far from here where there's a wool merchant whom we know. Some people are planning to go to him and borrow some money. Then we'll buy bajra flour, gur and oil from the market. We'll make a



mixture of these things and feed it to the sheep every day. We'll also get whatever medicines they need from the market.

If we don't improve the sheep's diet and give them the medicines in time, they might start dying. It is also very difficult to herd along sick animals over long routes. So we might have to sell off the sick animals along the way. Naturally, we won't get a good price for a sick animal, but at least we'll get some cash. This will help us buy more food and medicine for the other sheep.

The Aravalli Hills

Two months have passed and still our long walk continues. Now the Aravalli hills can be seen to the east.

In this area many farmers irrigate their fields from tube wells. They grow crops of wheat and gram in winters. Of course we can't graze the sheep in these fields. The animals can be grazed only in those fields that the farmers have left fallow. But the owners do let our animals eat the leaves of the trees growing on the fields. Sometimes, they even pay us to let our sheep graze and roam over unplanted fields. This is because the sheep fertilise their fields with their droppings.

In your area, do farmers have the animals manure their fields like this? If yes, then how do they repay the shepherds for this service?



Through all such difficulties, the winter months pass. After 4 or 5 months, the sheep are again thickly covered with wool. Since we are now in mid-journey, far from home, we don't have the time or the equipment to clean the sheep and shear the wool ourselves. So we call some shearers from the town near our camp and pay them to do it.

Wool merchants have shops in every 'kasba' and town along our route. The merchants themselves come to our camp to buy the wool.

The wool sheared at the end of the winter is not much in quantity, nor is it very clean. Therefore it doesn't fetch much of an income. However, we get enough money to repay what we had borrowed for the sheep's food and medicines. We send the remaining money back to our villages since by now our families back home must be running out of grain and must be finding it difficult to manage.

Why would the family members in the village have to face shortages of grain as winter ends? Explain.

Why do the shepherds get more income from monsoon wool than from winter wool?

The Summer

The months of March and April arrive. Now we have started heading out of Rajasthan for Haryana. In Haryana irrigation takes place through canals. The rabi crop of wheat is being harvested now. Therefore we are able to find many fields full of stubble (the stalks that remain after harvest), on which the sheep graze to their heart's content.

In Haryana, 'desi babool' also grows aplenty all around. Its leaves and fruits are very good for the sheep. However, we have to take care that the sheep do not end up eating 'vilayati babool' by mistake - this kind is poisonous for sheep.

Throughout April, May and June we continue herding the sheep from place to place in Haryana.

The Return Journey

Summer is passing. Now the rains are about to come. In Haryana, the fields will soon be ploughed. Preparations will be made for sowing. It won't be possible to graze sheep over here any longer. Anyway, now it's time to return to our desert villages.

During June and July we travel back. This long return journey in hot weather is full of hardships. On all the fields along the way preparations are on for the monsoon sowing. The sheep have to make do with whatever grass and leaves of trees they can find by the roadside. By the time we reach our villages in the desert, it will have rained and they will get fodder - it is with this hope that we keep walking along. If this hope gets dashed and the rains don't come by the time we return, we'll really be in a very dangerous situation - our very survival will be threatened.

Women cleaning wool



Drought

An example of such a crisis occurred in 1987. The shepherds returned home and there was not a drop of rain. Neither grass nor bajra could grow. The few leaves left on the shrubs were eaten within a few days. Where could they go? The whole of western Rajasthan was under a drought. The shepherds couldn't go back to Haryana - there would be crops standing in the fields there. If they stayed in their villages how would they save the animals from dying? And if the animals died, how would the people survive? Farming was already out of the question.

Do you know what the hundreds of sheep-rearers of the desert did? They borrowed money and hired trucks, loaded their sheep on to the trucks, and headed for the jungles of Madhya Pradesh. That was the only place they could find where their sheep could graze. They had to use trucks to get there because there wasn't enough fodder for the animals to eat along the way.

Thousands and thousands of sheep came to graze in the jungles of M.P. The forest department tried to stop this and they made the sheep-rearers pay heavy fines. As the drought-like situation in Rajasthan continued year after year, the shepherds

decided not to go back home at all for the monsoons. Instead they decided to use the forests of M.P to graze their sheep in the monsoon months. Hundreds of sheep-rearers of the Thar with 15-20 lakh sheep have left their villages forever. They keep moving between eastern Rajasthan, Uttar Pradesh and the jungles and the fields of Madhya Pradesh. They have gone to court against the restrictions and taxes that the forest department imposes upon them.

List the options the shepherds have during the monsoon months and write the pros and cons of each option.

Do the shepherds have the right to use the forest?

What harm might the shepherds bring on the forest:-

- *Would large numbers of trees be cut by them?*
- *Would small saplings planted by the forest department be eaten up by the grazing sheep?*

What benefits can the sheep bring to the forest?

Can a balanced policy be made to protect the forests and the needs of the shepherds? In your opinion, what will it contain?

Sand Dunes

In some parts of the Thar Desert there are vast dunes of shifting sand everywhere. Blown by the swift desert breeze the sand of one dune moves ahead and forms a new dune in a new place. In the absolutely dry summer months there are sand storms as well. Then it becomes difficult to go outside. Sometimes the winds blow the sand great distances, darkening the sky for days even in places as far away as Delhi.

Sand dunes can be seen all around in Jaisalmer, Bikaner, and Ganganagar. The sand dunes and sand storms create great problems for the irrigated agriculture of Ganganagar. The channels that carry water keep getting choked by sand. Sand settles over crops sown in the fields, crushing the smaller plants. Fields may have to be



reploughed and resown a number of times. Sand has to be removed from canals and from the fields many times.

Neither grass nor shrubs can grow on these shifting dunes. Hence they are of no use for grazing. Attempts are being made to plant shrubs on them,

so that the sand is not blown away. Shrubs could also provide fuel wood and fodder for animals.

Shifting sand dunes and sand storms are among the many hardships that the people of this dry region have to endure. There are no easy solutions for such problems.

Attempts to Make the Desert Green

There are no rivers in western Rajasthan, but just to the north lies Punjab. In Punjab the Sutlej, Beas, and Ravi, carry plenty of water throughout the year. Much of this water comes from the melting of the Himalayan snow.

In 1958 the Rajasthan Canal Project was taken up in order to build a 649 km long canal to bring water from the Sutlej to the desert of Rajasthan. As a result of this, the northern areas of Rajasthan are now being irrigated, especially in the Ganganagar district. Some areas bordering the canal that had been absolutely dry and sandy are now completely transformed into farmland.

Here, instead of one crop of bajra a year, two crops are taken. Wheat, gram, cotton, jowar, sugar cane, groundnuts, jeera, dhania, chillies and other crops are now being grown in the desert, thanks to the canal waters.

Earlier there were few people living in Ganganagar District. After the canal was built the government resettled many farmers of Punjab and Haryana there. These farmers were experienced in intensive farming. Many farmers of Rajasthan also adopted intensive irrigated agriculture.

Problems for the Shepherds

With irrigated farming taking place, the shepherds ran into problems. Sevan grass disappeared. Now crops are standing in the fields year round, and it has become difficult to graze animals. As a result, many people sold off their animals.

Too Much Water

Then, after a number of years of irrigation, the farmers also had to face a new and serious problem. Irrigating the sandy land resulted in raising the level of ground water. This happened because just 1.5 to 6 metres beneath the surface was a hard layer of limestone. The water from the canals and irrigated fields seeped down and collected on top of this layer of limestone. As the water level rose an area of about 8000 sq km became almost waterlogged and marshy.

Salination of the Soil

Since the water table rose up the salts found under the ground also dissolved in the water and came close to the surface of the soil. Thus, each year the soil gradually got more and more saline. After a number of years the fields got so saline that crops could no longer be grown. Cultivation had to be abandoned in such fields for many years.

As a result of the problems created by the canal waters, efforts are now being made to grow more of such crops that require less irrigation. Efforts are also being made to adopt irrigation techniques that do not waste as much water as happens when water flows through long channels to reach the crops. Attempts have been made to lay pipelines in fields and use sprinklers that enable water to reach the roots of the crops directly.

Many people suggest that instead of increasing irrigated farming in the desert, raising animals should be encouraged. Irrigation water could be used to grow grasses, and shrubs rather than crops. Since less water would be required, water logging and salinity would be reduced.

Exercises

1. Use your Atlas to answer the following questions:
 - a) Find three cities or towns that are in the Thar Desert.
 - b) Is the Thar Desert at the same elevation as most of the Ganga River Basin?
 - c) Is the Thar Desert at a higher or lower elevation compared to Ajmer and Udaipur?
 - d) According to the map in your Atlas, what is the average temperature in January in Bikaner?
2. How does water scarcity affect the lives of people in the desert? Explain.
3. Compare the eastern and western regions of Rajasthan. Mention differences and similarities in land, water, vegetation, agriculture and the life of people.
4. The people of the desert depend more on rainwater than on ground water. Why?
5. What kind of fodder do the sheep get in the monsoon, in the summer and in the winter?
6. When is the wool of the sheep sheared? How is the wool sold?
7. Why do the shepherds have to take loans?
8. If you were a shepherd in the Thar, what would you think if you heard the government was planning to build a canal near your village? Explain in detail.
9. What are three advantages and three disadvantages of introducing irrigated farming in the desert?
10. Look at the Table below and tell which kinds of animals are the second most important source of meat in India.

Meat and Poultry Produced in India (1995)

Source	Percent of total meat products
Cattle and buffaloes	40%
Sheep and goats	26%
Pigs	16%
Poultry (mainly chicken)	16%
Others	2%

(Source of data: National School Atlas, Department of Science and Technology, Government of India, 1999)

A man weaving with goat hair

