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Bhangar Soil

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Walk across the Gangetic plain and the ground changes under your feet. Near the river it is soft, fine and fresh. Further back, on higher land, it is older and firmer. That higher, older soil is called Bhangar.

This lesson covers what Bhangar is, how it differs from Khadar, and why farmers treat it differently. It ends with the salt-affected land that Uttar Pradesh has been reclaiming. Every fact comes from a school textbook or an ICAR research page.

Where does Bhangar sit in the northern plains?

What are the northern plains?

The northern plains are built from alluvial deposits brought by the **Indus, the Ganga and the Brahmaputra**. They stretch about 3,200 km from east to west.

The average width is 150 to 300 km. The alluvium is 1,000 to 2,000 m deep at its maximum.

The plain is almost featureless. Its height is mostly 50 to 150 m above sea level.

Sources: ncert.nic.in



Quick check 1. The northern plains are made of alluvium brought by the Indus, the Ganga and the Brahmaputra. *(True or False?)*

See answer ↓

Which zones make up the plains?

From north to south the plains have three zones. They are the **Bhabar**, the **Tarai** and the alluvial plains. The alluvial plains split further into Khadar and Bhangar.

So Bhangar is not a separate region. It is one part of the alluvial plains, south of the Tarai.

Sources: ncert.nic.in

What are the Bhabar and the Tarai?

The Bhabar is a narrow belt of 8 to 10 km along the Shiwalik foothills. Streams drop heavy rocks and boulders there, and some disappear.

South of it lies the Tarai, 10 to 20 km wide. The streams re-emerge there and make marshy, swampy ground.

The old and new alluvium begins further south.

Sources: ncert.nic.in

> **Quick check 2.** The alluvial plains lie north of the Bhabar. *(True or False?)* See answer ↓

Bhabar	8 to 10 km, boulders
Tarai	10 to 20 km, marshy
Alluvial plains	Bhangar and Khadar

What do the names Bhangar and Khadar mean?

The textbook classifies alluvial soils by age. Old alluvium is **Bangar**, also spelt Bhangar. New alluvium is **Khadar**.

The age of the deposit, and not the colour or the crop, gives the two names.

Sources: ncert.nic.in

How is Bhangar different from Khadar?

What is the clue for Bhangar?

The Class X textbook says Bangar soil has a higher concentration of **kankar** nodules than Khadar. Kankar is the clue most questions use.

So a question that stresses kankar is pointing to old alluvium.

Sources: ncert.nic.in

Which soil is finer and more fertile?

Khadar has more fine particles and is more fertile than Bangar. This follows from its newness.

The textbook adds that alluvial soil as a whole is very fertile. It holds enough potash, phosphoric acid and lime for sugarcane, paddy, wheat, other cereals and pulses.

Sources: ncert.nic.in

> **Quick check 3.** Bangar has a higher concentration of kankar nodules than Khadar. *(True or False?)* See answer ↓

How does grain size change across the plain?

Alluvial soil is a mix of sand, silt and clay. Moving inland towards river valleys, the particles grow somewhat bigger.

In the upper reaches, near the break of slope, the soil is coarse. Such soils are common in piedmont plains such as the Duars, Chos and Tarai.

Sources: ncert.nic.in

What happens in drier areas?

Soils in drier areas are more alkaline. The textbook says they can still be productive after proper treatment and irrigation.

This is why the last section of this lesson looks at salt-affected land.

Sources: ncert.nic.in

Bhangar	Old alluvium, more kankar, less fertile
Khadar	New alluvium, finer, more fertile

What landforms mark the plain?

The plains show features of a mature river stage. These include sand bars, meanders, ox-bow lakes and braided channels.

Most areas face periodic floods and shifting river courses. The Sunderbans delta and the Brahmaputra riverine islands are well-known examples.

Sources: ncert.nic.in

> **Quick check 4.** Khadar is the older alluvium and Bhangar is the newer alluvium. *(True or False?)* See answer ↓

Why does the alluvium matter for farming?

How widespread is alluvial soil?

Alluvial soil is the most widely spread and important soil in India. The whole of the northern plains is made of it.

It also extends into Rajasthan and Gujarat through a narrow corridor. It is found too in the eastern coastal deltas of the Mahanadi, Godavari, Krishna and Kaveri.

Sources: ncert.nic.in

Why is the alluvial belt so crowded?

Alluvial soils are very fertile, so these regions are cultivated intensively. They are also **densely populated**.

The link is simple. Good soil feeds many people, and many people settle where the soil is good.

Sources: ncert.nic.in

> **Quick check 5.** Alluvial soil is also found in the deltas of the Mahanadi, Godavari, Krishna and Kaveri. *(True or False?)* See answer ↓

What lives in the Tarai?

The Tarai has a luxuriant growth of natural vegetation. It also houses varied wildlife.

This is a direct result of the marshy ground. Water stays near the surface, so plants thrive, and animals find food and cover.

Sources: ncert.nic.in

Why do old and new alluvium sit side by side?

South of the Tarai lies one belt made of old and new alluvial deposits. The old deposits are called Bhangar and the new ones Khadar.

So the two soils are neighbours. Only the age of the deposit tells them apart.

Sources: ncert.nic.in

> **Quick check 6.** The Tarai is a dry belt with rocks and boulders. *(True or False?)* See answer ↓

Why call the plain a mature landscape?

The textbook says the plains show the mature stage of river erosion and deposition. Such rivers build sand bars, swing into meanders, leave ox-bow lakes behind and split into braided channels.

These features are all signs of a river that deposits more than it cuts.

Sources: ncert.nic.in

What is special about the Brahmaputra plains?

The Brahmaputra plains are known for their riverine islands and sand bars. Floods and shifting river courses are common there.

The river flows from the northeast to the southwest. At Dhubri it makes an almost 90 degree turn southward and enters Bangladesh.

Sources: ncert.nic.in

Which states form the water divide?

Haryana and Delhi form a water divide between the Indus and the Ganga river systems. Rain falling on one side drains to the Indus system, and rain on the other side drains to the Ganga.

The divide is a small rise in a very flat plain.

Sources: ncert.nic.in

> **Quick check 7.** Haryana and Delhi form a water divide between the Indus and Ganga systems. *(True or False?)* See answer ↓

What happens where the rivers meet the sea?

The mouths of these mighty rivers form some of the largest deltas of the world. The Sunderbans delta is the famous example.

Sources: ncert.nic.in

Which crops grow on the river valley plains?

The river valley plains have a fertile alluvial soil cover. It supports a variety of crops such as wheat, rice, sugarcane and jute.

The textbook links this fertility directly to the large population of the region.

Sources: ncert.nic.in

How flat is the plain really?

Apart from the river features, the plain is described as featureless. Its general height is 50 to 150 m above the mean sea level.

The textbook adds that rivers here shift their courses and flood periodically.

Sources: ncert.nic.in

What is a common exam trap about the name?

Bangar and Bhangar are two spellings of the same word. Questions may use either one.

Another trap is to call Bhangar the newer soil because it sits higher. It is the older soil. Height does not decide the name. Age does.

Sources: ncert.nic.in

> **Quick check 8.** Bangar and Bhangar are different soils. *(True or False?)* See answer ↓

Which soil holds more kankar?

Kankar nodules are lumps of lime found in the soil. The textbook says Bangar has more of them than Khadar.

If a question gives a soil with many kankar nodules and low fine content, pick Bhangar.

Sources: ncert.nic.in

Why does salt-affected soil matter beside Bhangar?

Sodic and salt-affected soils occur across the Indo-Gangetic plain. They make good alluvial land hard to farm.

So knowing the plain also means knowing its problem soils and how research centres fix them.

Sources: cssri.res.in; ncert.nic.in

Who helps reclaim the land?

The ICAR study stresses that local communities must take part in reclamation. Gypsum alone does not finish the job.

Farmers need water, advice and time before sodic fields give a good harvest again.

Sources: epubs.icar.org.in

What is done about salt-affected land in the Gangetic plain?

How much land is salt-affected?

ICAR-CSSRI says salt-affected soils cover nearly **6.73 million ha** in India. Uttar Pradesh accounts for about 1.37 million ha.

Most of these soils have a pH above 10 and an exchangeable sodium percentage above 15.

The centre calls soil sodicity a serious problem of the Indo-Gangetic plain.

Sources: cssri.res.in

How is sodic soil treated?

The usual treatment is gypsum. CSSRI found that marine gypsum, a by-product of making common salt, can replace mineral gypsum.

Marine gypsum is 92% pure and mineral gypsum is 70%. So about 23.8% less is needed per hectare of soil with pH above 10.

Sources: cssri.res.in

What did Uttar Pradesh do?

The Uttar Pradesh Bhumi Sudhar Nigam has led a sodic land reclamation programme since 1993, with World Bank support.

An ICAR study says it improved crop yields and farm productivity over three project phases. It also stresses that local communities must take part.

Sources: epubs.icar.org.in

Quick check 9. Gypsum is used to treat sodic soils. *(True or False?)* See answer ↓

Practice MCQs

1. Which term describes India's older alluvial soil of the Gangetic plains?

A. Terai

B. Regur

C. Bhangar

D. Khadar

See answer ↓

2. Roughly how far above the level of annual river floods does Bhangar soil sit?

A. 60 metres

B. 30 metres

C. 5 metres

D. 15 metres

See answer ↓

3. What are the irregular nodules of impure calcium carbonate found in Bhangar soil called?

A. Regur

B. Terai

C. Kankar

D. Bhabar

See answer ↓

4. What are the calcium carbonate nodules found in Bhangar soil called, and what does their presence indicate about the soil?

A. Loess; indicates wind-blown deposition

B. Kankar; indicates older, less-flooded soil

C. Laterite; indicates high-rainfall leaching

D. Regur; indicates volcanic origin

See answer ↓

5. Consider these two statements about Bhangar soil.

Statement 1: Kankar nodules form through leaching, as lime dissolves and re-precipitates lower in the soil.

Statement 2: In drier regions, Bhangar soil can show saline and alkaline efflorescence.

Which statement(s) is/are correct?

A. Only Statement 1 is correct

B. Only Statement 2 is correct

C. Both statements are correct

D. Neither statement is correct

See answer ↓

6. Match List I with List II and select the correct answer using the code given below the Lists: List I: A. Bhabar B. Bhangar C. Khadar D. Delta. List II:

1. Marsh

2. Silt

3. Gravels

4. Kankar

A. A-3, B-2, C-4, D-1

B. A-3, B-4, C-2, D-1

C. A-1, B-4, C-2, D-3

D. A-1, B-2, C-4, D-3

See answer ↓

Answer Key

1. **C.** Bhangar is the older alluvial soil of India's Gangetic plains. ↑ Q1
2. **B.** Bhangar sits on terraces roughly 30 metres above the level of annual river floods. ↑ Q2
3. **C.** Bhangar contains kankar, irregular nodules of impure calcium carbonate, in its subsoil. ↑ Q3
4. **B.** Bhangar soil contains calcium carbonate nodules called kankar, reflecting its status as older alluvium that escapes annual flooding, unlike Khadar. ↑ Q4
5. **C.** Kankar nodules do form through leaching, and drier-region Bhangar soil can indeed show saline and alkaline efflorescence. ↑ Q5
6. **B.** The answer is A-3, B-4, C-2, D-1. Bhabar consists of coarse gravels, Bhangar is old alluvium rich in kankar nodules, Khadar is fresh silty alluvium, and deltas are associated with marshy terrain. ↑ Q6

Quick-check answers

1. **True.** Both textbooks name these three river systems as the source of the alluvium. ↑ 1
2. **False.** The Bhabar lies along the Shiwalik foothills, then the Tarai, and only then the alluvial plains. ↑ 2
3. **True.** The Class X textbook says so, and kankar is the usual clue for old alluvium. ↑ 3
4. **False.** Bhangar is the old alluvium and Khadar is the new alluvium. ↑ 4
5. **True.** The Class X textbook lists these eastern coastal deltas. ↑ 5
6. **False.** The Bhabar holds the boulders. The Tarai is the marshy belt where streams re-emerge. ↑ 6
7. **True.** The Class XI textbook states this directly. ↑ 7
8. **False.** They are two spellings of the old alluvium. ↑ 8
9. **True.** CSSRI describes gypsum, mineral or marine, as the amendment for reclaiming sodic soil. ↑ 9

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