

Rajasthan is getting wetter and it's not good news for the desert ecology



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- *Environmental changes, such as changes in vegetation and water availability, have affected Rajasthan's desert ecology, impacting local flora and fauna.*
- *An increase in water availability has impacted the distribution of local species in Rajasthan, such as treepies and grey hornbills.*

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Environmental changes, including changing rainfall patterns and vegetation, have affected Rajasthan's desert ecology, impacting local flora and fauna. Rajasthan, the desert state of India, was in the news this July and August for the unusually heavy rains that lasted days, flooding towns and cities and marooning villages. The city of Jodhpur received 118 mm of rainfall in 24 hours on July 25-26.

The rainfall pattern of the state has been changing over the past three decades. According to the India Meteorological Department, there has been an increasing trend in the number of rainy days in the year, and heavy rainfall days during monsoons have risen in several districts. IMD's [analysis](#) says that between 1989-2018, a period of 30 years, there has been a "significant" increase in heavy rainfall days in the entire year, particularly for the western parts of the state.

Heavy rainfall days indicate more than 65 mm of rain in a day. The analysis also points to an increase in the total number of rainy days in a year for several districts within the same period. The [draft](#) Rajasthan State Action Plan on Climate Change (RSAPCC) 2022 also says that the western part of the state shows an increasing trend of more than 2 mm of rainfall per year, and so does the southeastern part. "The annual maximum rainfall shows a positive trend in several grids spread all over Rajasthan," the action plan said.

This change in rainfall pattern and vegetation has resulted in a gradual change in species of migratory birds coming to Rajasthan, wildlife biologist Sumit Dookia said. "In Jaisalmer in western Rajasthan, we

have observed a rising presence of the black francolin, a bird typical of a wet habitat," he said. This, Dookia went on to elaborate, is a development in process over several years.

"In the 1980s, the black francolin began to be seen in the Sri Ganganagar district in northern Rajasthan, adjoining Haryana. From there, the population began moving towards Bikaner and from there to Churu, in areas near the Indira Gandhi Canal," he said. Churu is sometimes called "The Gateway to Thar" and has a semi-arid climate.

Almost concurrently, there has been a dip in the appearance of the sandgrouse, a migratory bird visiting from Central Asia. The sandgrouse is a ground-dwelling bird that lives in arid and semi-arid habitats. "The Gajner Palace in Bikaner was well-known during the British Raj for hosting the imperial sandgrouse shoots during the Christmas season — that's how commonly it was found here during the winter season," Dookia said. And yet, in 2016, ornithologists were overjoyed to have spotted the black-bellied sandgrouse after a period of five years in Jaisalmer.



(black francolin)



(Chestnut-bellied sandgrouse)

Changing rainfall patterns and vegetation have resulted in a gradual change in species of migratory birds coming to Rajasthan. There is increase in presence of the black francolin, a bird typical of a wet habitat. Simultaneously, there has been a decrease in the appearance of the sandgrouse. [Photo](#) of black francolin by Shashank.Sekar/Wikimedia Commons. [Photo](#) of chestnut-bellied sandgrouse by Rejichandran/Wikimedia Commons.

"Increase in water availability, which could include more rainfall, has had an impact on the distribution of local species in Rajasthan," Chetan Misher, a researcher at the Ashoka Trust for Research in Ecology and Environment (ATREE) said. "For example, the treepie and the grey hornbill are now more commonly seen here. These are birds not native to desert habitats. The jungle cat, not a typical desert species, is expanding; the distribution of desert foxes is reducing. An increase in water availability is leading to an increase in the wild boar population. So overall environmental changes in which change in rainfall patterns are possibly playing a role is leading to certain changes in the distribution of local fauna."

He also added that more research needs to be done on this subject. "At present, there is not enough quantitative data on this subject."

Misher adds, "If we take avian diversity, species like rufous treepie or grey hornbill are more forest-dwelling species but now are frequent sightings in desert landscapes. Similarly, the increased woody cover has also shown an impact on rodent species composition. Increased greening and water availability may lead to an infestation of more generalist rodents like lesser bandicoots as pests. Also, species like the desert fox shows avoidance of thick green woodlands as they are typically adapted to open dry grassland and desert environment."

Radheshyam Bishnoi, a local conservationist in Jaisalmer said that the jungle cat, a local species, is not as commonly seen as it used to be in the Desert National Park (Jaisalmer) or Pokhran. "They seem to be changing their habitat," he said. According to the wildlife census by the forest department of the Rajasthan state government, in 2010, the number of jungle cats in protected areas was 1011; this reduced to 830 in the year 2020. However, their presence outside protected areas was found to have increased in the same period.



Local conservationists report a change in the presence of the jungle cat, a local species, that is not as commonly seen as it used to be in the Desert National Park (Jaisalmer) or Pokhran. According to the wildlife census by the forest department of the Rajasthan state government, in 2010, the number of jungle cats in protected areas was 1011; this reduced to 830 in the year 2020. Photo by Radheshyam Bishnoi/Mongabay.

It is, however, a different story for the Indian wolf (*Canis lupus pallipes*), categorised as endangered by the IUCN. In 2010, the wildlife census of the Rajasthan forest department put the number of Indian wolves at 1289 (365 in protected areas and 924 outside protected areas). By 2020, their numbers had dwindled to 682.

“The Indian wolf used to be the top predator of the Thar desert and was found in all districts up to the 1990s. Thereon it was largely exterminated by shepherds and nomads,” Dookia said. “Since human settlements increased into the interior desert habitat, they (wolves) were in direct conflict with the shepherds. Now they are restricted to a few places near the Luni riverbed in Jodhpur and the foothills of the Aravallis.”

An increase in agricultural fields and a greater vegetation cover is one of the probable causes for the increase of the nilgai, or Asian antelope population here. Known to prefer grassy plains, the number of nilgai in 2015 was 70, 924. This increased to 80, 234 in 2020.

Effects of the Indira Gandhi Canal

Over the last few decades, major efforts have been underway to boost agriculture and increase the state's green cover. The Indira Gandhi Nahar Project (IGNP), or the Indira Gandhi Canal, whose origin in 1952 was aimed at improving irrigation and drinking water facilities in Rajasthan, has played an important role in boosting agriculture. Sand deposition on the canal, however, was identified as a challenge. Hence shelter belt plantations on either side of the canal began to be carried out.

In the same vein, afforestation efforts to stabilise shifting sand dunes were also carried out. Bare dunes were planted with ‘brushwood and windbreaks, perpendicular to wind direction’ so that the dunes do not interfere with the canal system and irrigated farmlands. Having said that, between 1970 to 2013, there has been a 16 percent decline in sand dunes which is “a concern”, according to P. C. Moharana of the Central Arid Zone Research Institute (CAZRI), and he blames “indiscriminate plantation” for this.

So, while on the one hand, there is an improvement in the agricultural and overall economy of the state, even an improvement in the green cover — the India State of Forest Report says that between 2017 and 2019, there has been a [marginal increase](#) of 57.51 sq km of forest cover in Rajasthan mainly because of plantation and conservation activities — it does not bode well for the desert ecology.

The RSAPCC 2022 states, “The landscape of western Rajasthan's Thar region has changed due to variation in climatic conditions and continuous water supply from the Indira Gandhi Canal, which has led to variation in the flora and fauna of the place.”



The Indira Gandhi Nahar Project (IGNP), was aimed at improving irrigation and drinking water facilities in Rajasthan. However, the RSAPCC 2022 states that, the landscape of western Rajasthan's Thar region has changed due to variation in climatic conditions and continuous water supply from the Indira Gandhi Canal, which has led to variation in the flora and fauna of the place. [Photo](#) by SivendarSM/Wikimedia Commons.

Dookia agrees. "Massive plantations (there is a linear strip of vegetation along the canal), formation of water bodies on either of its side, intensive agriculture with double cropping, has impacted the rainfall pattern, particularly over western Rajasthan," he said. Giving an example, he said that *sewan*, a kind of bushy grass species typical of this region, is no longer found in areas near the IGNP. Where the canal does not flow, the grass continues to grow.

 The Indira Gandhi Canal has affected *sewan*, a bushy grass species typical of this region. The grass is no longer found in areas where the Indira Gandhi Canal flows but in other areas, it still grows. Photo by Radheshyam Bishnoi/Mongabay.

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Change in rainfall pattern is also one of the probable causes why *phog* or *Calligonoum polygonoides*, a "natural binder of the dunes" is becoming rarer. G. V. Thivakaran of Gujarat Institute of Desert Ecology (GUIDE) added, "Changing rainfall pattern is a major impact of climate change. The estimated sea level rise is 3.5-4 mm every year. This impacts flora and fauna like it is being observed."

Banner image: Thar Desert, Jaisalmer, Rajasthan, India. [Photo](#) by Flicka/Wikimedia Commons.

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