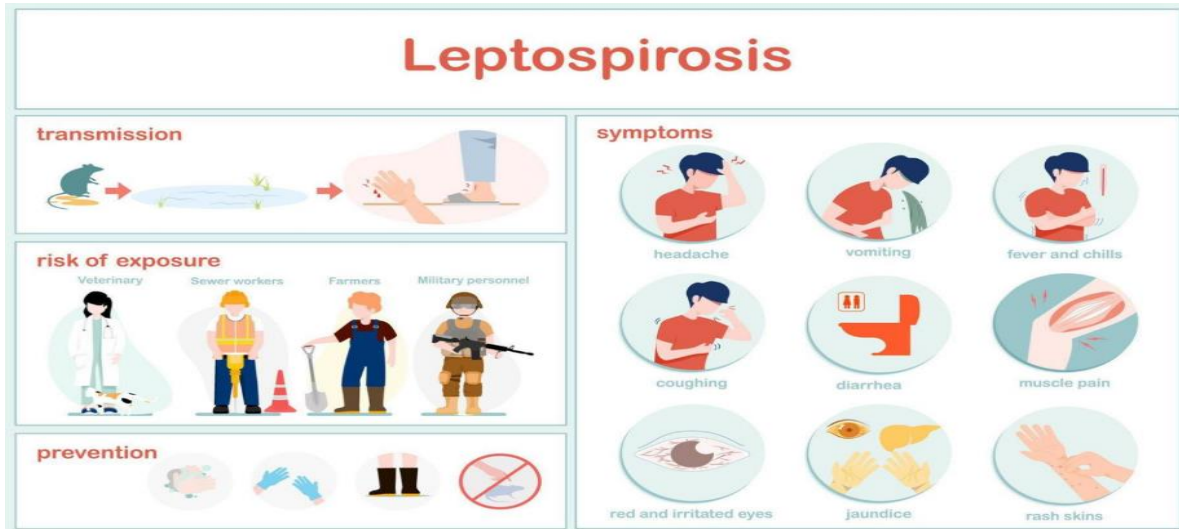


# UPSC CURRENT AFFAIRS NOTES 18-09-2023

## LEPTOSPIROSIS



Odisha is currently facing two disease outbreaks: Scrub Typhus and Leptospirosis, resulting in the deaths of six people in the state. The most recent death from Scrub Typhus was reported in Sundergarh district, while five people in Bargarh district had previously succumbed to the disease.

The Odisha Government has issued directives to district health authorities to intensify surveillance in response to the seasonal increase in Scrub Typhus and Leptospirosis cases. Authorities have been instructed to use appropriate antibiotics and maintain an adequate stock of drugs.

The State Health Department has emphasized the importance of ensuring the availability of tests, sensitizing doctors to recommend tests in cases of PUO (Prolonged Febrile Illness), raising public awareness, enabling early diagnosis, and maintaining increased surveillance.

### Scrub Typhus

#### Origin

Scrub typhus is caused by the bacterium *Orientia tsutsugamushi*, which is transmitted to humans through the bite of infected larval mites (chiggers). These mites are commonly found in rural and forested areas, as well as in areas with tall grasses and vegetation.

Scrub typhus is most prevalent in the Asia-Pacific region, including countries like India, Japan, and Southeast Asian nations.

#### Symptoms

The hallmark symptom of scrub typhus is a high fever, which can spike rapidly.

- Patients often experience severe headaches.
- Muscular and joint pain is common.

- Some individuals develop a rash, which may be accompanied by itching.
- Swollen lymph nodes are another common feature.
- Nausea, vomiting, and abdominal pain can occur.
- Cough and difficulty breathing are possible in severe cases.

### Treatment

Scrub typhus is treatable with antibiotics such as doxycycline or azithromycin. Early diagnosis and prompt treatment are essential to prevent complications.

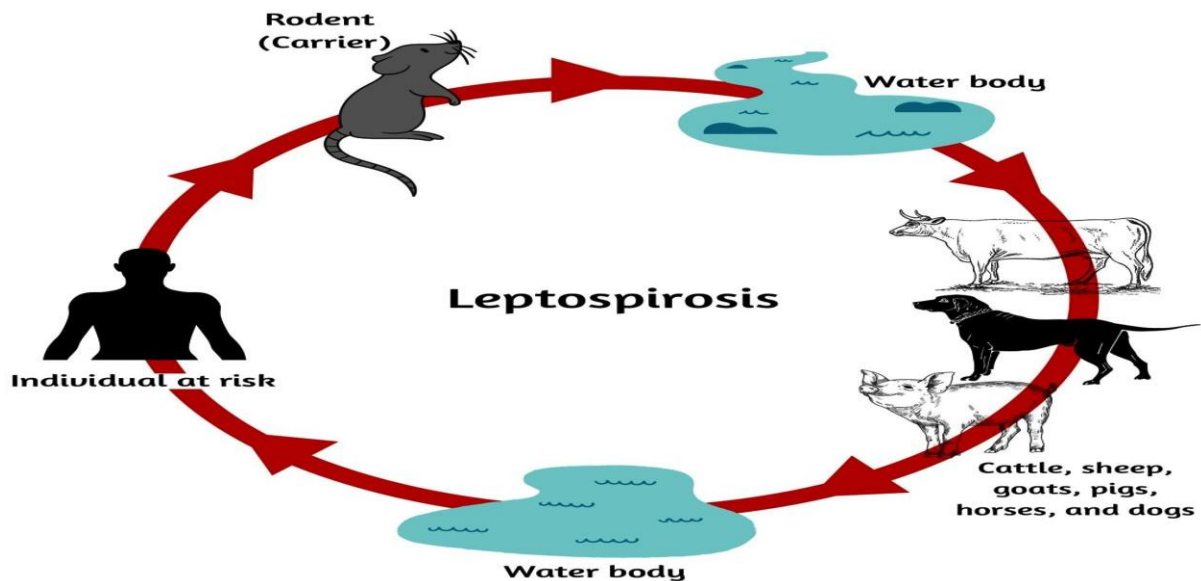
There is no vaccine available for scrub typhus, so prevention primarily involves avoiding exposure to chigger-infested areas by wearing protective clothing and using insect repellent.

## Leptospirosis

### Origin

Leptospirosis is caused by a group of spirochete bacteria called *Leptospira*. These bacteria are typically found in the urine of infected animals, including rodents, cattle, and dogs.

Humans can become infected through contact with contaminated water, soil, or environments where infected animals have urinated.



### Symptoms

Like scrub typhus, leptospirosis often presents with a sudden onset of high fever.

- Severe headaches are common.
- Patients may experience shivering or chills.
- Nausea and vomiting are frequent symptoms.
- Conjunctival suffusion, a condition where the eyes appear red without discharge, can occur.
- Pain in the abdomen is another possible symptom.
- Some individuals develop a rash.

- Muscle aches and weakness are reported.

### Complications





Without treatment, leptospirosis can lead to severe complications, including kidney damage, liver failure, meningitis, respiratory distress, and even death.

### Treatment

Leptospirosis is treated with antibiotics, typically doxycycline or penicillin, which are most effective when administered early in the course of the illness. Supportive care may also be necessary to manage symptoms and complications.

Prevention involves avoiding exposure to contaminated water and minimizing contact with potentially infected animals.

There is a vaccine available for certain strains of *Leptospira*, which can be considered in high-risk situations.

<b>WHAT IS LEPTOSPIROSIS</b>		
<p>➤ Leptospirosis is a bacterial disease that affects both humans and animals</p>	<p>➤ It is caused by bacteria of the genus leptospira</p>	<p>➤ In humans, it can cause a wide range of symptoms, some of which may be mistaken for other diseases</p>
<p><b>HOW DO HUMANS GET INFECTED</b></p> <p>➤ The infection spreads first from animals through their urine </p> <p>➤ Humans get infected through direct contact with urine of infected animals or with a urine-contaminated environment</p> <p>➤ This infected urine gets mixed with water in puddles, waterlogged streets or flooded areas </p> <p>➤ Humans who wade through such water may get infected</p> <p>➤ The bacteria enters body through cuts or abrasions on skin, or through mucous membranes – nose and eyes </p> <p>➤ Person-to-person transmission is rare</p>		<p><b>ANIMAL SPECIES THAT CAN TRANSMIT THE DISEASE TO HUMANS</b></p> <p>A wide variety of animal species, primarily mammals, may serve as sources of human infection </p> <p><b>The following are considered to be the most important in this context:</b></p> <p><b>1</b> Small mammal species, notably feral and peridomestic rodents (rats, mice, voles, etc.) and insectivores (shrews and hedgehogs)</p> <p><b>2</b> Domestic animals (cattle, pigs, dogs, more rarely sheep, goats, horses and buffaloes)</p> <p><small>(Source: World Health Organization, Centre for Disease Control)</small></p>

### BAGAMATI RIVER

A boat carrying 32 school students capsized in the Bagmati River in Bihar's Muzaffarpur on Thursday. Media reports said that the accident happened when the students were on the boat to go to the school. Based on the information, the locals rushed to the spot and rescued at least 18 students. However, more than 10 students are still missing and efforts are underway to rescue them.



## Details

### About

Bagmati River is a transboundary river between the Nepal and India. It starts its journey from Kathmandu, Nepal and it ends in the Koshi River near Bornesthan, Bihar, India. The total length of the Bagmati is 3 km. The Bagmati River flows through the Kathmandu Valley in Nepal and is separated from Kathmandu through Patan, traveling through Province No. 2 of Nepal's southern section before entering the Indian state of Bihar. A pair of religions, Hindus and Buddhists, regard this river as sacred. The Nepalese considered the Bagmati to be the source of their culture and urbanization. On the banks of the Bagmati, there are numerous cities and shrines. Furthermore, the population on the Bagmati's banks is dense, and the river is heavily polluted and filthy.

The Bagmati is also significant because Hindus are burned on the ridges of the sacred creek, while Kirants are buried in the rocks by its flank.

According to the Nepalese Hindu religion, the deceased body should be bathed three times in the Bagmati before entombment to stop the rebirth process.

### Location

- The Bagmati River flows through Nepal's Kathmandu Valley.
- The river runs through the valley of Nepal's capital, passing through various important cities.

### Origin

- The Bagmati River originates in the Shivapuri Hills north of Kathmandu and runs south through the city.

The **Nagarjun Forest Reserve**, located near where the river begins its downstream journey, is a protected region abounding with species and breathtaking beauty.

### Mouth of the Bagmati River

The river eventually merges with the **Narayani River**.

This confluence is located in southern Nepal, not far from the city of Triveni.

The combined waters of the Bagmati and Narayani finally flow southward into the Ganges.

### Basin features of Bagmati River

- The area around the Bagmati is full of beautiful vistas.
- The Kathmandu Valley, which is rich in history and culture, is right in its path.
- Numerous historical and cultural attractions, including several major temples and ghats (steps down to the river), may be found along the Bagmati's banks.
- Hindus see the Bagmati as sacred and possess great spiritual significance for them.



- The Pashupatinath Temple, located on the river's edge, is another famous Hindu pilgrimage site dedicated to Shiva.
- The riverbanks are a popular meeting spot for believers, who frequently gather to light funeral pyres and perform other religious rites.
- The Bagmati basin is also critical to the Kathmandu Valley's water supply.
- It aids farming activities, supplies drinking water, and maintains the local ecosystem.

### Tributaries

- Several minor rivers fall into the Bagmati, which then flows downstream as one unit. The following are some of the major branches that feed into the Bagmati:
- The Bishnumati River flows across the Kathmandu Valley, past the modern city of Kathmandu and the historic city of Patan, from the Shivapuri Hills. It meets the Bagmati near Teku.
- The Manohara River, which flows through the northern part of the Kathmandu Valley, originates in the Nagarjun Forest Reserve.
- A major tourist spot is the confluence of the Guheshwori Temple and the Bagmati.
- The Dhobikhola River passes through Kathmandu and Tripureshwor on its journey from its headwaters in the Shivapuri Hills to the Kathmandu Valley.
- It is joined by the Bagmati shortly below Tripureshwor.
- The Bagmati River is vital to the residents of the Kathmandu Valley because of these and other tributaries, as well as several smaller streams and rivulets.

### PM Modi launches Vishwakarma Scheme



**Prime Minister Narendra Modi launched the PM Vishwakarma scheme in New Delhi on the occasion of Vishwakarma Jayanti. Vishwakarma, in Hindu mythology, is seen as the architect of the gods and was the divine carpenter and master craftsman. The**



## **scheme will provide government support to workers engaged in traditional crafts and skills.**

This scheme was first announced by PM Modi during his Independence Day speech.

The scheme is also being seen as a means for the government to reach out to the economically marginalised and socially backward communities – particularly the Other Backward Classes (OBC) groups.

### **About**

It is a new scheme with an outlay of Rs 13,000 crore and is fully funded by the Central government. It aims to provide subsidised loans of up to Rs 2 lakh to traditional artisans and craftsmen including weavers, goldsmiths, blacksmiths, laundry workers, and barbers.

The scheme also aims at improving the quality, as well as the reach of products and services of artisans and craftsmen. This scheme will ensure that Vishwakarmas are integrated with the domestic and global value chains.

### **Nodal Ministry**

Ministry of Micro, Small & Medium Enterprise (MSME) is the nodal ministry.

The Ministry of Tribal Affairs, would provide active support for implementation of the scheme for the wellbeing of the Vishwakarmas.

### **Eligibility & coverage**

It is available for rural and urban artisans and craftsmen across India.

However, a detailed list was produced to clarify the beneficiary under the scheme.

This list included 18 traditional crafts such as Boat Maker; Armourer; Blacksmith; Hammer and Tool Kit Maker; etc.

Five lakh families will be covered in the first year and 30 lakh families over five years.

### **Benefits under the scheme**

The Vishwakarma workers will be registered for free through Common Services Centres (CSC) using the biometric-based PM Vishwakarma portal.

They will then be provided recognition through the PM Vishwakarma certificate and ID card.

They will be given:

skill upgradation involving basic and advanced training,

a toolkit incentive of ₹15,000,

collateral-free credit support up to ₹1 lakh (first tranche) and ₹2 lakh (second tranche) at a concessional interest rate of 5%,

incentive for digital transactions and marketing support.

A toolkit booklet has also been released in 12 Indian languages, with accompanying video elements.



This will aid the knowledge of workers on new technologies in their field.

Skilling programme will take place at both basic and advanced types.

Participants will get a stipend of ₹500 per day while undergoing training.

What was the need of PM Vishwakarma scheme?

The professionals engaged in traditional crafts and skills for centuries are often taught by elders in the family and have faced certain problems.

These include a lack of professional training for their work, of modern tools, the issue of distance from the markets relevant to them and the availability of little capital for investment.

## **Project Cheetah, a year on**

India's cheetah introduction programme has completed one year. The first batch of eight cheetahs from Namibia arrived on September 17, 2022, officially launching Project Cheetah. The cheetah population used to be fairly widespread. The animal was found from Jaipur and Lucknow in the north to Mysore in the south, and from Kathiawar in the west to Deogarh in the east. The cheetah was officially declared extinct by the Indian government in 1952.

### **How did cheetahs go extinct in India?**

Over-hunting was a major contributing factor for the cheetah's extinction.

The decimation of its relatively narrow prey base species and the loss of its grassland-forest habitat also played a role.

India's emphasis on agriculture, which included acquiring and parceling off grassland, further led to a decline in the cheetah's habitat.

### **Earlier attempts to bring back the cheetah**

India's first attempt to bring back the cheetah was in the early 1970s. Dr Ranjitsinh was tasked with carrying out negotiations with Iran.

However, it could not lead to the translocation of Cheetahs due to following reasons:

Potential release sites in India needed to be upgraded with an increase in prey base and greater protection.

During the process, Emergency was declared in the country and soon after, the regime of the Shah of Iran fell.

While the Persian Cheetah was preferred for relocation, as it was Asiatic, this is no longer possible as the cheetah population in Iran has dwindled to under 50.

While attempts to relocate cheetahs to India began in 2009, it was only in 2020 that the Supreme Court of India finally gave the green signal for such efforts.

News Summary: Project Cheetah, a year on



Why have African cheetahs been introduced in India?

The goal of the introduction of African cheetahs is to “establish viable cheetah metapopulation in India that:

allows the cheetah to perform its functional role as a top predator and,

provides space for the expansion of the cheetah within its historical range thereby contributing to its global conservation efforts.

Basically, the project aims to enable cheetahs to establish themselves as viable and free-ranging populations in large, unfenced wildlife reserves which are in turn connected by wildlife corridors to other unfenced reserves.

### **What is the status of the project?**

Introduction and birth

In total, 20 adult African cheetahs have been imported so far.

The first batch of eight cheetahs arrived on September 17, 2022.

Another batch of 12 cheetahs from South Africa arrived on February 18, 2023.

In late March 2023, one of the females gave birth to a litter of four cubs which were conceived in India.

### **Release of Cheetahs into the wild**

So far, only 12 of the 20 cheetahs were ever released into the wild, with a few being brought back multiple times to the Kuno National Park (KNP).

This was because the managers felt that the cats were moving into areas that may have posed risks for their survival.

Death

Six of the cheetahs which came from Africa have died. Four while still in captivity and two in the wild.

Additionally, three of the four cubs have died and the only remaining cub is being hand reared as its mother has rejected it.

### **Steps taken after the deaths of Cheetahs**

Since the deaths of the three cheetahs in July-August, all 10 of the remaining free cheetahs have been captured and kept captive in enclosures for observation, removal of radio-collars and treatment.

Current status

On the first anniversary of the project, all the surviving 14 adult cheetahs and one cub are in captivity.

There is talk of them being radio-collared again and released once the winter sets in.





The project authorities are talking of additional sites being prepared for releasing the cheetahs such as the Gandhi Sagar Wildlife Sanctuary and Nauradehi Wildlife Sanctuary, both in Madhya Pradesh.

The project authorities are also talking of importing more cheetahs from Africa sometime next year.

### **Reason for cheetahs death**

There have been a variety of reasons and causes attributed to the deaths of the six adults and three cubs.

### **Role of Radio collars**

Radio collars are not the underlying reason for the deaths of any of these cats, at least that is the officially stated position.

One needs to determine if the African cheetahs are susceptible to certain insects and parasites in India, and if the collars provide a micro-environment conducive for these to thrive.

### **Other factors**

1st cheetah died due to a renal condition.

One of the females died when authorities attempted to get the cheetah to mate inside the enclosure.

3 of the four cubs born - died due to heatwave conditions.

One of the males died due to cardio-pulmonary failure but what caused it (the ultimate cause), has still not been determined.

The last three deaths occurred during the monsoon.

### **Final verdict**

While there have been several conflicting reports regarding the cause of their deaths, no definitive cause has been shared in the public domain.

### **What are the lessons to be learnt?**

proper and adequate habitats, there is no point in importing more cheetahs.

Experts believe that there is need to focus on the establishment of high-quality habitats covering at least 5,000 square kilometres before bringing more cheetahs from Africa.

We cannot rely on simply importing more cheetahs to establish a viable population while neglecting its habitat requirements.

Also, the other weakness has been the lack of wider consultation and transparency. This definitely needs to improve.

## TRAILGUARD AI CAMERA

Wildlife officials in India, specifically in the Kanha-Pench corridor in Madhya Pradesh, have been experimenting with a new type of camera trap system that incorporates Artificial Intelligence (AI) technology.



These camera traps are designed to count wild animals and monitor potential poaching activities.

**TrailGuard AI Camera-Alert System:** The new camera system being tested is referred to as the "TrailGuard AI camera-alert system." Unlike traditional camera traps, these devices are slim and inconspicuous, shaped like a pen, measuring 13.8 cm long and 1.4 cm wide. They are connected to a communication unit about the size of a notepad.

**Specific Species Targeting:** The TrailGuard AI camera-alert system is equipped with embedded software that allows it to be programmed to take pictures of specific species of interest. This feature helps reduce the likelihood of capturing irrelevant images, such as leaves or non-target animals. Users can instruct the system to capture images of humans or particular species like lions, tigers, or cheetahs.

**Swift Notifications:** According to researchers and developers involved in the system, the TrailGuard AI cameras provided rapid notifications of wildlife presence. They mention that notifications were sent via email or push notifications to researchers and forest department officials within 30 to 42 seconds after detecting wildlife. This real-time alert system can be crucial for responding to potential threats, including poaching incidents.

**Application in Tiger Reserves:** The system was tested in the Kanha-Pench corridor and the Dudhwa Tiger Reserve. In the Kanha-Pench corridor, it helped capture poachers on camera, leading to a conviction. In addition to its anti-poaching capabilities, the system was also used for tracking the presence of tigers in the vicinity.



**Advantages over Traditional Camera Traps:** Traditional camera traps have limitations, such as the need for physical access to retrieve photos and limited battery life. The TrailGuard AI camera-alert system overcomes these limitations with its compact design and AI-based targeting.

## **Artificial Intelligence and Environmental Conservation**

Artificial Intelligence (AI) is a field of computer science that focuses on creating intelligent machines capable of performing tasks that typically require human intelligence. In recent years,

AI has emerged as a powerful tool to tackle pressing environmental issues.

### **Applications of AI in Environmental Conservation**

#### **Wildlife Conservation**

**AI-Powered Camera Traps:** In various wildlife reserves, AI-equipped camera traps are used to monitor animal populations. For instance, in India's Kanha-Pench corridor, the TrailGuard AI camera-alert system has captured images of poachers, aiding in their apprehension and the protection of endangered species like tigers.

**Automated Species Recognition:** AI algorithms are employed to identify and track specific animal species. For example, the Wildbook project uses AI to analyze photos and social media posts to track individual animals like whales, dolphins, and zebras, helping researchers understand population dynamics and movements.

#### **Ecosystem Monitoring**

**Satellite Data Analysis:** AI is used to analyze vast amounts of satellite data to monitor changes in ecosystems. For example, Google's Global Fishing Watch employs AI to detect and track illegal fishing activities by analyzing vessel movements worldwide, contributing to sustainable fisheries management.

**Deforestation Detection:** AI-powered systems, such as Global Forest Watch, analyze satellite imagery to detect and report deforestation in near real-time, enabling timely interventions to protect forests.

#### **Climate Change Mitigation**

**Climate Modeling:** AI-driven climate models, like those developed by the National Center for Atmospheric Research (NCAR), improve our understanding of climate change patterns, helping policymakers make informed decisions.

**Energy Efficiency:** Google's DeepMind uses AI to optimize data center cooling systems, reducing energy consumption by 30%. Similar AI applications optimize the operation of wind turbines, increasing energy generation efficiency.

#### **Natural Disaster Prediction and Response**

**Hurricane Tracking:** The National Oceanic and Atmospheric Administration (NOAA) employs AI models to predict hurricane paths and intensities more accurately, giving communities more time to prepare and evacuate.



**Wildfire Prediction:** AI-driven systems, such as the California-based company Descartes Labs, analyze satellite and climate data to predict and monitor wildfires, allowing for faster responses and evacuations.

### Resource Management

**Precision Agriculture:** Companies like John Deere use AI-equipped machinery to optimize planting, irrigation, and harvesting, reducing resource usage and improving crop yields.

**Waste Management:** AI is used to optimize waste collection routes in smart cities, reducing fuel consumption and emissions. Sorting robots in recycling facilities improve recycling rates.

### Benefits of AI in Environmental Conservation

**Efficiency:** AI processes large datasets quickly, allowing for real-time monitoring and faster decision-making in conservation efforts.

**Accuracy:** AI enhances data analysis and prediction accuracy, aiding in effective resource allocation and risk assessment.

**Cost-Effective:** Automated monitoring reduces the need for extensive human labor and can operate 24/7.

**Innovative Solutions:** AI-driven technologies introduce novel solutions to complex environmental challenges.

### Key AI Technologies in Environmental Conservation

**Machine Learning:** Algorithms that can recognize patterns in data, such as image recognition for wildlife monitoring.

**Deep Learning:** A subset of machine learning, deep learning models, like neural networks, are used for complex tasks like climate modeling.

**Computer Vision:** AI's ability to interpret visual information is critical for tasks like species identification and surveillance.

**Natural Language Processing (NLP):** NLP can be used to analyze textual data related to environmental conservation efforts.

### Ethical and Social Implications

#### **Data Privacy:**

The collection of extensive environmental data raises concerns about data security and individual privacy.

**Bias and Fairness:** AI algorithms may inherit biases from their training data, potentially exacerbating environmental injustices.

**Job Displacement:** Automation of traditional roles in agriculture and resource management may lead to job displacement.



RV Educational Institutions®  
RV Training Academy®

Environmental Impact of AI: Building and operating AI infrastructure consumes energy, contributing to environmental challenges.

Access and Equity: Ensuring that AI-driven solutions are accessible to all communities, including marginalized ones, is crucial.