

Current Affairs - 10 September 2024

HOW SWACHH BHARAT MISSION ADVANCED PROGRESS ON SAFETY AND DIGNITY, HEALTH, AND ECONOMY

Significance of Swachh Bharat Mission

- **Ambitious and Bold Announcement**
 - When PM Modi announced the mission from the Red Fort on August 15, 2014, **he did so with a conviction that few could have anticipated.**
 - This was **not merely about constructing millions of toilets; it was about catalysing a behavioural shift** among over half a billion people—a population larger than that of most countries.
- **Transformation of a Hidden Problem into a National Priority**
 - Historically, **sanitation has been a taboo topic in India**, rarely discussed openly, let alone addressed at a national level.
 - By **addressing open defecation** in such a public and determined manner, PM Modi **elevated the issue from a matter of private discomfort to one of public urgency.**
 - This bold move was essential in transforming what was once a hidden problem into a national priority.
- **A Vision to Change the Mindset Along with Infrastructure**
 - The sheer scale of the SBM's goal **changing the behaviour of 550 million people in just five years was unprecedented.**
 - It required **not only the construction of over 100 million toilets but also the creation of a social movement** that would make the use of these toilets a norm.

An Analysis of Health, Economic and Social Impact of Swachh Bharat Mission

- **Health Impact**
 - **Reducing Child and Infant Mortality Rate**



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- One of the most significant achievements of the SBM has been its impact on public health, particularly in reducing infant and child mortality rates.
- The recent scientific report published in the Nature journal highlights that the SBM has saved the lives of approximately 60,000 to 70,000 infants and children under the age of five each year.
- **Reduction in Infectious Disease**
 - **Open defecation has long been associated with the spread of infectious diseases**, as human waste left in the open contaminates water sources and the environment.
 - **The widespread construction of toilets under the SBM, coupled with efforts to promote their use, has dramatically reduced the incidence of these diseases**, thereby improving child survival rates.
- **Reduction in Overall Disease Burden**
 - **The mission's success in eliminating open defecation has not only reduced the immediate risks of contamination but has also developed a culture of cleanliness** that extends to other areas of daily life.
 - **This cultural shift towards better hygiene practices has had a cascading effect on reducing the spread of infectious diseases**, contributing to overall improved health outcomes across the population.
- **Economic Impact**
 - **The mission's success in making communities Open Defecation Free (ODF) has translated into significant financial savings** for households and the broader economy.
 - **A study conducted by UNICEF estimated that achieving ODF status in a village could result in each household saving approximately Rs 50,000 annually.**

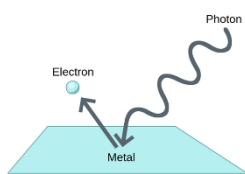
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- These savings stem from several factors, including reduced medical expenses, increased productivity, and time savings.
- **Social Impact**
 - One of the most significant social benefits of the mission has been the **enhancement of dignity and security for women.**
 - Before the SBM, the **lack of access to toilets forced many women to defecate in the open**, often under the cover of darkness to maintain their modesty.
 - **This not only compromised their dignity but also exposed them to the risk of harassment, assault, and even sexual violence.**

Conclusion

- **The Swachh Bharat Mission has achieved remarkable success in its first decade**, with profound impacts on public health, economic savings, and social well-being.
- **The program's success is a testament to the power of bold leadership, community participation, and sustained effort.**
- As the world continues to grapple with the challenges of providing universal access to sanitation and clean water, **the lessons from the SBM offer valuable insights for other countries striving to achieve similar goals.**

WHAT IS PHOTOELECTRIC EFFECT?



Researchers are breathing new life into the phenomenon of photoelectric effect, which is paving way for better imaging of proteins and viruses, gaining a deeper understanding of biochemical reactions and choosing new materials for next-generation electronics.

- It is a phenomenon where electrons are emitted from a material's surface when it is exposed to **light of sufficient frequency.**

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- When light photons hit the surface of a material, usually a metal, they transfer their energy to the electrons. If this energy is sufficient, the electrons are emitted from the material.
 - The **energy must be greater than the electron's binding energy**, known as the work function, for the electron to be ejected from the material's surface.
 - The excess energy from the photon, after overcoming the work function, is converted into the kinetic energy of the ejected electron.
 - A material that can exhibit this phenomenon is said to be **photoemissive**, and the ejected electrons are called Photoelectrons.
 - The effect was **discovered in 1887** by the German physicist **Heinrich Rudolf Hertz**.
 - The photoelectric effect is **pivotal in understanding the quantum nature of light**, as it reveals that light possesses both wave-like and particle-like properties.
 - This duality is a **cornerstone of quantum mechanics**, illustrating how light can exhibit behaviors characteristic of both waves and discrete particles.
 - The discovery and understanding of the photoelectric effect have profound implications in various scientific and technological fields, including the **development of photovoltaic cells and advanced imaging technologies**.
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YELLOW FOOD DYE



Recently, a recent study has demonstrated that tartrazine, a common food dye, can make the skin of living mice temporarily transparent.

- It is also known as **tartrazine** and is a **synthetic food colorant** classified as an azo dye.
- It is lemon yellow in color and **water-soluble**.
- It is used in many dairy products, beverages, desserts and confectionaries etc.

Highlight of the study



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- This dye absorbs blue light strongly, which yields its characteristic **orange-to-red color** when dissolved in water.
- This happens because the blue part of the light is absorbed, leaving **only the orange-to-red part visible**.
- Normally, biological tissues scatter light due to their diverse composition of proteins, fats, and liquids.
- Researchers found that a **concentrated tartrazine solution** can match the **refractive indices** of these components, reducing light scattering and allowing light to pass through. This makes the skin appear transparent.
- When applied, **tartrazine absorbs certain wavelengths** of light, especially red light, changing how light interacts with the tissue.
- This effect enabled the researchers to see blood vessels, internal organs, and muscle contractions in real time.

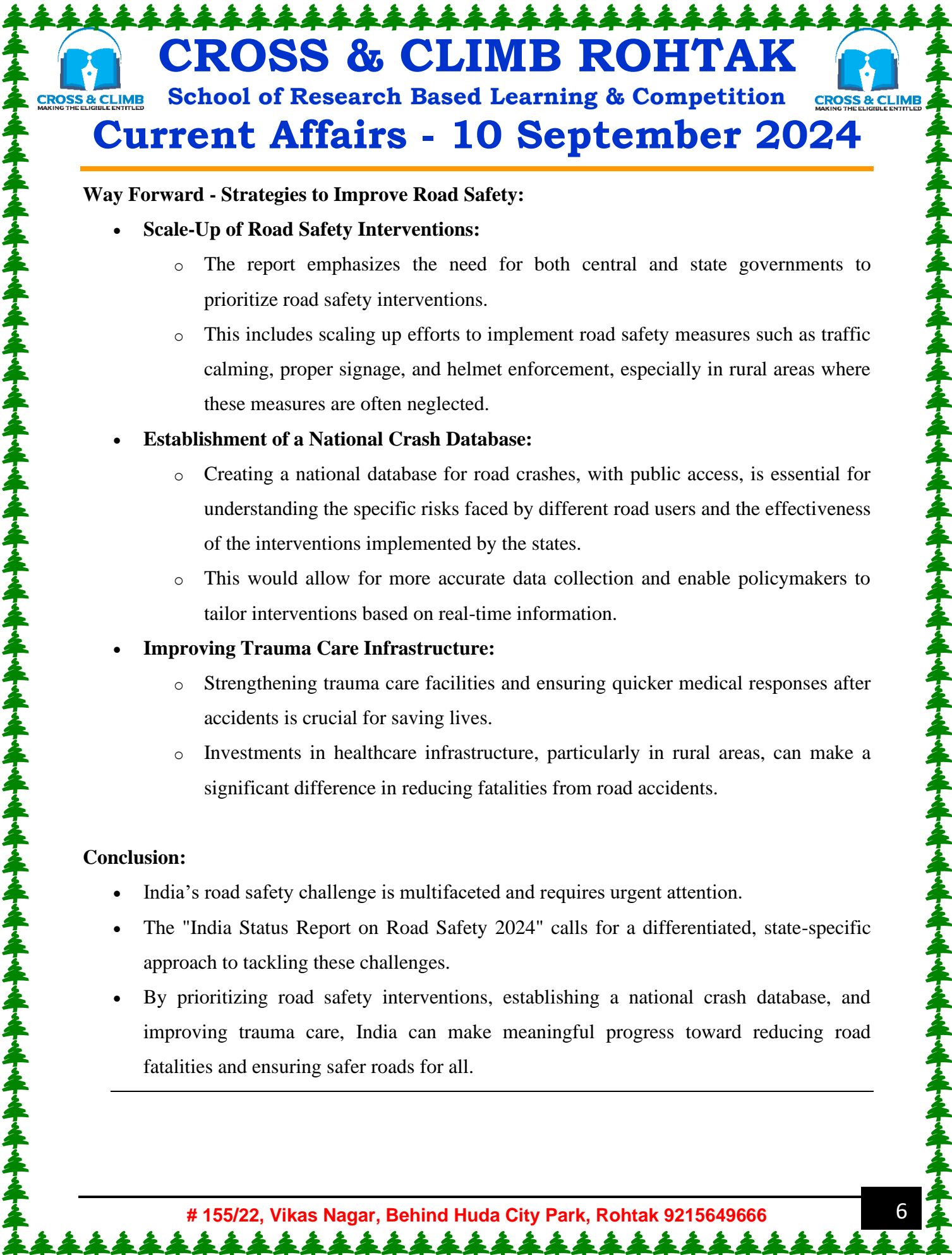
Potential Applications

- This technique could simplify blood draws, improve laser tattoo removal and aid in **early cancer detection**.
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CHALLENGES TO ROAD SAFETY IN INDIA

Background:

- Road safety remains a critical public health issue in India, with a high number of fatalities and injuries resulting from road accidents every year.
- The "**India Status Report on Road Safety 2024**," prepared by the TRIP Centre at **IIT Delhi**, sheds light on the slow progress made in reducing road accident deaths and emphasizes the need for focused interventions.
- This article delves into the key findings of the report, the current state of road safety in India, and potential strategies for improvement.



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Way Forward - Strategies to Improve Road Safety:

- **Scale-Up of Road Safety Interventions:**
 - The report emphasizes the need for both central and state governments to prioritize road safety interventions.
 - This includes scaling up efforts to implement road safety measures such as traffic calming, proper signage, and helmet enforcement, especially in rural areas where these measures are often neglected.
- **Establishment of a National Crash Database:**
 - Creating a national database for road crashes, with public access, is essential for understanding the specific risks faced by different road users and the effectiveness of the interventions implemented by the states.
 - This would allow for more accurate data collection and enable policymakers to tailor interventions based on real-time information.
- **Improving Trauma Care Infrastructure:**
 - Strengthening trauma care facilities and ensuring quicker medical responses after accidents is crucial for saving lives.
 - Investments in healthcare infrastructure, particularly in rural areas, can make a significant difference in reducing fatalities from road accidents.

Conclusion:

- India's road safety challenge is multifaceted and requires urgent attention.
 - The "India Status Report on Road Safety 2024" calls for a differentiated, state-specific approach to tackling these challenges.
 - By prioritizing road safety interventions, establishing a national crash database, and improving trauma care, India can make meaningful progress toward reducing road fatalities and ensuring safer roads for all.
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DISTRICT AGRO-METEOROLOGY UNITS



Recently, Press Trust of India reported that the India Meteorological Department (IMD) is planning to revive District Agro-Meteorology Units (DAMUs) under the Gramin Krishi Mausam Sewa (GKMS) scheme.

- These were established by the **India Meteorological Department (IMD)** in 2018 in collaboration with the **Indian Council of Agricultural Research (ICAR)**.
- **Aim:** The aim was to use weather data to prepare and disseminate sub-district-level agricultural advisories.

Working

- The DAMUs were located within **Krishi Vigyan Kendras (KVKs)**.
- Scientists and researchers trained in meteorology and agriculture were recruited as DAMU staff.
- They used weather data provided by the IMD like **rainfall, temperature and wind speeds** to prepare agricultural advisories related to sowing and harvesting, usage of fertilizers and pesticides, irrigation, etc.
- These advisories were sent to millions of farmers across the country free of cost in **local languages twice a week**.
- They were shared via text messages, WhatsApp groups, newspapers and also through in-person communication from DAMU staff and KVK officers.
- These advisories provided weather information in advance, they helped farmers plan activities like irrigation.
- They also served as early warnings for extreme events like droughts and heavy rainfall. Many studies conducted over the years have stressed the benefits of agro-met advisories.



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NILGIRI MOUNTAIN RAILWAY

The Coonoor railway station which is part of the Nilgiri Mountain Railway (NMR) line is being completely transformed as part of the Amrit Bharat Station Scheme and is criticized by heritage train and history enthusiasts.



- **Location:** The Railway line from Mettupalaiyam to Ooty is 45.88 km. long and lies partly in the Coimbatore District and partly in **Nilgiri District of Tamilnadu**, on the eastern slopes of the Western Ghats.
- It is fondly called **the Ooty toy train** of the Nilgiris Railway Company, first chugged up the hills on **June 15, 1899**.

History:

- It was in 1854, that the first plans were made to build a mountain Railway from **Mettupalaiyam to the Nilgiri Hills**.
 - But it took the decision-makers 45 years to cut through the bureaucratic red tape and complete the construction and installation of the line.
 - The line was completed and opened for traffic in June 1899.
 - It was operated first by the Madras Railway under an agreement with the Government.
 - In 2005, the Nilgiri Mountain Railway was **recognized as a UNESCO World Heritage Site**, joining the ranks of India's other famous mountain railways, such as the Darjeeling Himalayan Railway and the Kalka-Shimla Railway.
 - This designation underscores the railway's cultural and historical importance, as well as its role in showcasing India's rich heritage.
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WHAT ARE MYRISTICA SWAMPS?



Myristica Swamps are freshwater swamps dominated by evergreen trees belonging to the **Myristicaceae** family.

- They are also denoted as **living fossils** due to the **primitive nature** of **Myristica** plants.

- With an evolutionary origin of about 140 million years, the swamps are valuable for evolutionary studies.
- These forests are characterized by **trees with large protruding roots jutting out of waterlogged soil**, which remains inundated throughout the year.
- **Geographical distribution:** In India, these unique habitats occur in the **Western Ghats** and a smaller distribution exists in the **Andaman and Nicobar Islands** and **Meghalaya**.
- Historically, they formed a large hydrological network all along the Western Ghats.

Climatic conditions: The formation of these swamps is dependent on **abiotic conditions like the shape of the valley between the forested hills**, the amount of rainfall a place receives (with an average of 3000 mm) and water availability throughout the year.

- Typically, Myristica swamps are seen next to rivers and help in retaining water and act as a sponge, ensuring perennial water availability.
- These forests have **higher ability to sequester carbon** than non-swampy forests.
- These swamps are home to many **vertebrate and invertebrate faunal species**. This is due to stable macroecological conditions like **high humidity, moderate temperature, and macrohabitat availability**.
 - One example is the Myristica Swamp Treefrog (*Mercurana myristicapalustris*), only reported from a few pockets of the Shendurney and Peppara Wildlife Sanctuaries in Kerala.