TCAS KAVACH

This article covers "Daily Current Affairs" and the topic details "TCAS Kavach". This topic has relevance in the "Economy" section of the UPSC CSE exam.

For Prelims:
What is TCAS Kavach?
For Mains:
GS3: Economy
Infrastructure: Railways

Why in the news?

Railway officials have said that the domestically developed Train Collision Avoidance System (TCAS) 'Kavach' was not in place on the route where the Andhra Pradesh train collision occurred.

About TCAS Kavach:

• Kavach is an advanced cab signalling and train control system with built-in anti-collision features to enhance railway safety.

• Kavach was developed by the Indian Railways Research Designs and Standards Organisation (RDSO) over ten years, starting in 2012.

Functions of Kavach:

o Acts as a guardian for the existing railway signalling system, ensuring enhanced safety.

• **Warning and Automatic Braking:**

o Alerts the locomotive pilot in the event of failing to recognize a 'red signal.'

o If the pilot does not slow down below 15 kilometers per hour after receiving warnings, Kavach takes control and automatically applies the brakes to bring the train to a halt.

Components of Kavach Infrastructure:

1. **Radio Frequency Identification (RFID) Technology:** Installed in the tracks, using radio waves to identify objects and convey information wirelessly.

2. **Locomotive Equipment:** Locomotive cabins have RFID readers, computers, and brake interface systems.

3. **Radio Infrastructure:** Towers and modems are established at railway stations.

Working of Kavach Infrastructure:

• The three components (RFID in tracks, locomotive equipment, and radio infrastructure) communicate with each other.

• They constantly monitor train movements and transmit signals ahead to locomotives.

- The system remains effective even in challenging conditions such as hilly terrain or poor visibility.
- Direct communication between locomotives is established, sharing information about location and track IDs when multiple trains share the same track.
- Locomotives use antennas to communicate with towers at railway stations, displaying warnings on the driver's monitor.

Unique Features of the Kavach	
Cost	Kavach is cost-effective, priced at Rs 50 lakh per kilometre, significantly cheaper than the European Train Control System (ETCS), which costs about Rs 2 crore worldwide.
Compatibility with Existing Infrastructure	Kavach doesn't replace traditional lineside signalling; it serves as a cab signalling train control system with anti-collision capabilities, enhancing existing infrastructure.
Comprehensive Coverage	The Kavach program covers railway stations, signalling devices, and various train types, unlike the previous Auxiliary Warning System (ACD), which was limited to specific trains and locomotives.
Incorporation of Key Elements from Other Systems	Kavach integrates elements from established systems like the European Train Protection and Warning System and the indigenous Anti Collision Device. Plans include features from the European Train Control System Level-2.
Future Compatibility	Ongoing efforts aim to make Kavach compatible with 4G LTE technology and expand its application to global markets.
Safety Integrity Level (SIL)	Kavach adheres to the highest safety and reliability standards known as Safety Integrity Level.

Cost of Deploying Kavach:
- Deployment costs ₹50 lahks per kilometre for Indian Railways.
- Current Kavach coverage is limited to 65 trains (1,500 kilometers), with potential for a lengthy implementation process. This amounts to only 2 percent of all trains in India.

Funding Allotment for Kavach:
- Indian Railways allocated **₹4,000 crore** under the Signalling and Telecom budget head.
- This budget may enable the implementation of Kavach on about 2,500 to 3,000 kilometres of railway tracks in the upcoming year.

Q1. Which of the statements given below correctly describe TCAS Kavach?
(a) A Public health initiative aimed at providing affordable healthcare services and insurance coverage
(b) Government of India program for protecting critical infrastructure from cyber threats.
(c) A program designed to protect and preserve a country's cultural heritage, including historical sites, monuments, and artifacts.
(d) An automatic train protection technology designed to prevent rail accidents
Answer: (d)

Q2. Consider the following statements regarding Kavach:
1. Kavach is a cutting-edge signalling and control system with built-in anti-collision features.
2. Kavach was developed by the Council of Scientific & Industrial Research (CSIR).
3. Kavach is limited to specific trains and locomotives.
How many of the abovementioned statements are correct?
(a) Only one
(b) Only two
(c) All three
(d) None
Answer: (a)

Q3. Discuss the significance of the domestically developed Train Collision Avoidance System (TCAS) 'Kavach' in enhancing railway safety.

Gaurav Nikumbh

POSHAN TRACKER

This article covers "Daily Current Affairs" and the topic details " Poshan Tracker". This topic has relevance in the Social Justice section of the UPSC CSE exam.

For Prelims:
About Poshan Tracker?
For Mains:
GS 2: Social Justice
Significance of Poshan Tracker?
Challenges?
Way Forward?

Why in the news?
The launch of the Poshan Tracker by the Indian government stands as the most extensive mobile phone-based nutrition monitoring system in the annals of global health.

Introduction:
- Poshan Tracker, the largest mobile phone-based nutrition monitoring system globally, is revolutionizing nutrition monitoring in India.

- Unlike previous global examples, Poshan Tracker demonstrates universal uptake among Anganwadi workers, reaching nearly 3 million users across India.
- Central to Poshan 2.0 guidelines, this app aims to ensure transparency and accountability in nutrition service delivery.

Unprecedented Data Monitoring:
- Poshan Tracker offers real-time monitoring of over 50% of children under five in India, covering their height and weight measurements.
- Nearly 94% of beneficiaries have been Aadhar-verified.
- The app captures national, state, and district-level data on Anganwadi infrastructure, ration distribution, and nutritional outcomes.

Significance of Poshan Tracker:
- Acts as a real-time feedback loop for frontline workers to identify and address malnutrition in its early stages.
- Key modules include beneficiary registration, growth monitoring, and migration tracking.
- The app targets beneficiaries facing acute malnutrition and tracks the effectiveness of ICDS services.

Challenges:
- Poshan Tracker's effectiveness in improving data accuracy and timeliness remains a question.
- Decision-makers may not highly value older data.

Accuracy and Potential:
- A study from Indonesia shows a mobile app can significantly improve growth monitoring accuracy.
- Poshan Tracker uses WHO growth charts to automatically calculate nutritional outcomes, reducing manual errors.
- Granular data addresses malnutrition variability and provides timely information for decision-makers.

Way Forward:
- User-friendliness improvements and feedback from overburdened Anganwadi workers are crucial.
- Ongoing skill-building and technical assistance are needed for system sustainability.
- Poshan Tracker's data must catalyze actionable outcomes in delivering essential services to address malnutrition.

Source:
Mother, child and the Poshan Tracker | The Indian Express

Q.1 Consider the following statements regarding Poshan Tracker:
1. Poshan Tracker is the largest mobile phone-based nutrition monitoring system globally.
2. The app captures real-time data on the height and weight measurements
Which of the statements given above is/are correct?
(a) 1 only

(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2
ANSWER: C

Q.2 Poshan Tracker, an innovative technology platform, has been introduced to monitor the progress of India's National Nutrition Mission (POSHAN Abhiyaan). Discuss the significance of Poshan Tracker in addressing the issue of malnutrition in India. What are the key features and challenges associated with its implementation, and how can it contribute to achieving better nutritional outcomes?

Rishabh