

UPSC Syllabus Topic : GS GS Paper 3 Agriculture – Major crops-cropping patterns in various parts of the country.

On Production of Pulses in India – Attaining self-sufficiency

Increasing pulse production in India brings several advantages:

1. **Food Security:** Boosting production addresses concerns about food security, ensuring a stable supply of essential dietary items.
2. **Environmental Benefits:** Enhancing pulse cultivation aids in environmental sustainability, particularly through nitrogen fixation, enhancing soil fertility, and reducing the carbon footprint.
3. **Reducing Imports:** Higher domestic production helps cut down on the need for importing pulses, reducing the import bill and enhancing self-reliance.
4. **Addressing Protein Deficiency:** Pulses are rich in dietary fibre and plant-based proteins, combating protein deficiency prevalent in many parts of the country.
5. **Enhancing Soil Fertility:** Pulses have the ability to fix nitrogen in the soil, thus improving soil fertility for future crops.
6. **Low Water Requirement:** Their suitability for cultivation in regions with erratic rainfall or depleting groundwater reserves makes pulses a valuable crop for water-scarce areas.

Government initiatives aimed at increasing pulse production include:

1. **Self-Sufficiency Goals:** The government aims for self-sufficiency in pulses by 2027.
2. **Tur Dal Procurement Portal:** Platforms where farmers can sell their produce directly to specific government agencies, like NAFED and NCCF, are being established.
3. **MSP Hikes:** Minimum support prices for various pulse varieties have seen increments to encourage production.

The status of pulse imports in India has witnessed a decline, mainly due to decreased imports of yellow peas and chickpeas, attributed to higher import duties and increased domestic procurement. Challenges with pulse production include low yields, particularly in marginal lands, and storage issues due to their shorter shelf life compared to wheat and rice.

To address these challenges, efforts should focus on:

1. **Improving Productivity:** Strategies to boost yields through better farming practices and technological advancements.
2. **Expanding Pulse Cultivation:** Encouraging a shift from water-intensive crops like paddy, especially in water-deficient states like Punjab.
3. **Higher MSPs:** Increasing minimum support prices can incentivise farmers to cultivate more pulses, ensuring better availability and stable prices in the market.

UPSC Syllabus Topic : GS Paper 3 Science & Technology – Awareness in the fields of Space.

On the Aditya-L1 mission and ISRO outreach

The L1 Lagrange point, chosen by ISRO for its Aditya-L1 mission, is situated 1.5 million km away from Earth, marking one of the five Lagrange points within the earth-sun system. These points represent positions where the gravitational forces of the two bodies balance out, allowing a smaller object placed there to maintain its position without experiencing a significant pull towards either body. Utilising this point enables Aditya-L1 to conserve fuel while stationed at L1.

Aditya-L1, classified as an observatory-class solar mission, is equipped with various instruments to study the sun:

1. **VELC**: A coronagraph designed to investigate the sun's uppermost atmospheric layer.
2. **SUIT**: An ultraviolet imaging telescope.
3. **SoLEXS and HELIOS**: Instruments dedicated to the study of solar flares and coronal mass ejections.
4. **ASPEX and PAPA**: Tools aimed at examining the solar wind and plasma.
5. **Digital Magnetometers**: A set of instruments employed to measure the characteristics of the magnetic field surrounding the spacecraft.

For ISRO, enhancing public outreach efforts could be beneficial. This could involve organising open days dedicated to specific missions and consistently communicating new findings and updates to the public. Expanding these efforts can improve awareness and engagement with ISRO's missions and scientific advancements.

UPSC Syllabus Topic : GS Paper 3

Lessons can India learn from Japan Airlines

The recent collision at Tokyo's Haneda airport involving a Japan Airlines Airbus A350 and a Japanese Coast Guard Bombardier Dash 8 resulted in five fatalities on the smaller aircraft, while all 379 passengers on the JAL plane survived. This unfortunate incident brings to light several other notable aviation mishaps:

1. **Air France AF 358 (2005)**: Overshot the runway in heavy rain in Toronto, causing a fire; all 309 passengers evacuated safely, with 11 injuries.
2. **Emirates EK 521 (2016)**: Crashed during landing due to passenger disruption while grabbing hand luggage, leading to evacuation delays.
3. **Air India Airbus (2023)**: Endured an extreme hard landing in Dubai, resulting in a week-long grounding due to significant operational and safety concerns.
4. **Indian Airlines IC 171 (1976)**: Crashed due to confusion between operating Boeing and Caravelle aircraft.
5. **Indian Airlines Airbus Crash (1990)**: Resulted in 92 fatalities due to deficiencies in pilot training.

From the Japan Airlines incident, India can draw several crucial lessons:

1. **Effective Crew Training**: Highlighting the significance of comprehensive emergency training for crews, ensuring orderly evacuations despite challenges.
2. **Passenger Discipline**: Emphasising the importance of passenger adherence to safety protocols, avoiding delays caused by retrieving hand luggage during evacuation.
3. **Rapid and Transparent Response**: Urgency in releasing ATC transcripts and swift investigation reports is essential for thorough inquiries, unlike the usual prolonged investigations in India.
4. **Adherence to Safety Protocols**: Acknowledging and acting upon issued notices and clearances to prevent lapses leading to incidents like runway collisions.

Aircraft evacuation standards mandate a complete evacuation within 90 seconds, utilizing only half of the emergency exits. This ensures preparedness for various scenarios where exits may be blocked or damaged, derived from preventing flashovers in post-crash fires.

A "hard landing" refers to a critical aviation concern where the aircraft endures substantial force during touchdown. It's measured using "touchdown g," which signifies the gravitational force on the aircraft's tires. A "touchdown g" exceeding 1.8 is considered hard, indicating a force 1.8 times the aircraft's weight.

To bolster aviation safety, airlines must prioritise rigorous training, compliance with operational standards, and address pilot fatigue and stress. Incorporating lessons from incidents like Japan Airlines' successful evacuation and Air India's hard landing is crucial, focusing on discipline, communication, and maintaining high standards in crew selection and emergency protocols. The Directorate General of Civil Aviation (DGCA) is India's regulatory body in civil aviation, overseeing safety, airworthiness, and regulation of air transport services to, from, and within India, working in coordination with the International Civil Aviation Organisation (ICAO).
