Prelim Bits 03-12-2021 | UPSC Daily Current Affairs

Crumb Rubber

The Government has decided to use Crumb Rubber Modified Bitumen in bituminous pavement courses during road construction.

> Bituminous pavements are constructed in different layers such as base course, binder course and surface course.

- Crumb rubber is recycled rubber produced by reducing scrap tires or other rubber into uniform granules.
- Crumb rubber is manufactured from 2 primary feedstocks:
    1. Tire buffings, a by-product of tire retreading and
    2. Scrap tire rubber.
- During the recycling process, the inherent reinforcing materials such as steel and fiber are removed along with any other type of inert contaminants such as dust, glass, or rock.
- Normal bitumen modified with crumb rubber & other additives has improved performance compared to normal bitumen.

Reference

1. https://pib.gov.in/PressReleasePage.aspx?PRID=1777240
2. https://scraptirenews.com/information-center/crumb-rubber/
3. https://theconstructor.org/transportation/bituminous-pavement-layers/20784/

UN Report on Mullaperiyar Dam

A report by the UN University-Institute for Water, Environment and Health has mentioned about certain safety concerns of the Mullaperiyar dam.

- The report stated that around 93% of the world's largest dams are located in 25 nations.
- The construction of large dams has been declining steadily in the last 40 years.
- **Life expectancy** - The average life expectancy of a dam is 50 years.
- Globally around 10,000 more dams have reached or exceeded the alert age limit of 50 years and many are expected to approach 100 years soon.
- In India, around 1,115 large dams will be roughly 50 years old in 2050
- Around 4,250 large dams will be more than 50 years old in 2050.
- 64 large dams in India will be more than 150 years old in 2050.
- **Mullaperiyar -** The report said that Mullaperiyar dam, built in 1895, is situated in a landslide-prone area (seismically active area).
- If India's Mullaperiyar Dam were to fail, 3.5 million people are at risk.
- The dam shows significant structural flaws and its management is a contentious issue between Kerala and Tamil Nadu States.

- To know more about Mullaperiyar Dam, click here.

Commissioning or de-commissioning of dams owned by State Governments is exclusively within the purview of the dam owning State.

Reference

1. https://pib.gov.in/PressReleasePage.aspx?PRID=1777257
2. https://unu.edu/media-relations/releases/ageing-dams-pose-growing-threat.html
3. https://timesofindia.indiatimes.com/city/kochi/kerala-mullaperiyar-dam-has-outlived-its-life-says-un-study-report/articleshow/87251544.cms

National Policy on Biofuels

- The Government notified the National Policy on Biofuels (NPB) in 2018 to promote the use of biofuels in the country.
- The NPB envisages a target of 20% blending of ethanol in petrol by 2030 and 5% blending of biodiesel in diesel by 2030.
- **Categories** - NPB categorises bio-fuels into
    1. "Basic Biofuels" - First Generation (1G) bioethanol & biodiesel and
    2. "Advanced Biofuels" - Second Generation (2G) ethanol, Municipal Solid Waste (MSW) to drop-in fuels, Third Generation (3G) biofuels, bio-CNG etc..
- They are categorised to enable extension of appropriate financial & fiscal incentives under each category.
- The Policy expands the scope of raw material for ethanol production by allowing use of
    1. Sugarcane Juice,
    2. Sugar containing materials like Sugar Beet, Sweet Sorghum,
    3. Starch containing materials like Corn, Cassava,
    4. Damaged food grains like wheat, broken rice, Rotten Potatoes, unfit for human consumption for ethanol production.
- The Policy also allows use of surplus food grains for production of ethanol for blending with petrol with the approval of National Biofuel Coordination Committee.
- NPB indicates a viability gap funding scheme for 2G ethanol Bio refineries of Rs.5000 crore in 6 years in addition to additional tax incentives, higher purchase price as compared to 1G biofuels.
- It encourages setting up of Supply Chain Mechanisms for biodiesel production from non-edible oilseeds, Used Cooking Oil, short gestation crops.

Reference

1. https://pib.gov.in/PressReleasePage.aspx?PRID=1777219
2. https://vikaspedia.in/energy/policy-support/renewable-energy-1/biofuels/national-policy-on-biofuels-2018

Gold Mirrors of James Webb Space Telescope

The James Webb Space Telescope scheduled to be sent into orbit soon has an important object, which is a large gold mirror.

- These mirrors will help **collect light** from the objects being observed.

- The primary mirror, the lightweight mirrors, coatings, actuators and mechanisms, electronics, and thermal blankets when fully deployed form a single precise mirror.
- The primary mirror is made of 18 hexagonal-shaped mirror segments stitched together in a honeycomb pattern.
- The hexagonal shape allows for a roughly circular, segmented mirror with high filling factor and six-fold symmetry.
- All these mirrors can fold up and fit into a rocket and then unfold in space.
- Each mirror segment is made from beryllium. Beryllium is used as it is both **strong and light**.
- After the beryllium mirror segments were polished a thin coating of gold was applied to it using a technique called vacuum vapour deposition. Gold helps improve the **mirror's reflection** of infrared light.
- To know more about the James Webb Space Telescope, click here.

Beryllium

- Beryllium is very strong for its weight and is good at holding its shape across a range of temperatures.
- Beryllium is a good conductor of electricity and heat and is not magnetic.
- Because it is light and strong, beryllium is often used to build parts for supersonic airplanes and the Space Shuttle.

Reference

1. https://indianexpress.com/article/explained/explained-gold-mirrors-james-webb-space-telescope-7650774/
2. https://webb.nasa.gov/content/observatory/ote/mirrors/index.html

Climate Change & Locust Infestations

Experts said that the infestation of desert locusts is closely linked to climate change, as a hotter climate is linked to more damaging locust swarms.

- Therefore, plans to mitigate climate change must include action against pests and diseases.
- **Bane** - Locusts have been a bane especially to farmers in several countries, including India, Pakistan and Iran.
- Locust infestations can also harm livelihoods and be a threat to regional investments in ensuring food security.
- **Reasons** - Change in cyclonic patterns over the Arabian Sea is behind the locust invasions in east Africa, west and south Asia.
- Unusual rainfall in Iran helped in their breeding.
- **Control** - Locusts can be controlled using broad-spectrum pesticides.
- But these pesticides may be highly toxic to environment, humans and animals. They are a threat to pollinators and wildlife.
- **Measures** - The following measures could be taken to control locust infestation:
    1. A well-functioning early warning system,
    2. Counting the environmental and human costs through True Cost Accounting,
    3. Developing an efficient governance model,
    4. Governing the locusts crisis may also provide useful lessons for the agri-food system,
    5. Research on the biopesticide sector must be funded and
    6. Satellite and weather data, along with field observations, can be used for building powerful predictive models on breeding sites.

Reference

1. https://www.downtoearth.org.in/news/climate-change/climate-change-locust-infestations-fao-seeks-adaptation-plans-at-cop26-event-80154
2. https://www.unep.org/news-and-stories/story/locust-swarms-and-climate-change