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De-Silting of Rivers

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Why in News: Inland Waterways Authority of India (IWAI), on the basis of analysis of 25 years of data of river Yamuna has informed that, in general, there has been bed level changes in deep channels in the range of 1 to 2 meter which include erosion as well as deposition.

Major changes in bed profile have been observed in the years of high floods. Based on a Detailed Project Report completed in January 2020, IWAI has assessed the minimum depth of river Yamuna from Jagatpur in Delhi to the confluence of the Ganga and Yamuna rivers at Sangam, Prayagraj (1,089 km)

Erosion and deposition of silt is a natural process in alluvial rivers. Rivers pickup, carry and drop silt load as per their regime conditions i.e. discharge in the river slope, morphology, nature of silt etc.

The issue of desilting of rivers has been considered by the Government since long and in this context a multi-disciplinary **Committee headed by former Chairman, Central Water Commission in 2002 (Mittal Committee) had studied the siltation pattern in few rivers in India.**

The Committee has opined that large scale desilting of rivers, in general, is not feasible technically due to several reasons like non-sustainability, non-availability of vast land required for the disposal of dredged material etc.

Desilting of rivers in vulnerable reaches may be undertaken based on model study, if it is found techno-economically viable. Cost effective measures for removal of drainage congestion in specific reaches of rivers for channel capacity improvement and navigation purposes are formulated and implemented by concerned States/ agencies as per requirement. The Union Government renders assistance to States which is technical, advisory, catalytic and promotional in nature.

The Ministry of Environment, Forest and Climate Change has issued Sustainable Sand Mining Guidelines, 2016 and Enforcement & Monitoring Guidelines for Sand Mining, 2020 for matters related to sand mining.

This information was given by the Minister of State for Jal Shakti, Shri Bishweswar Tudu in a written reply in Rajya Sabha.

Guidelines for works on De-siltation of river Ganga

- **An Expert Committee (Chair: Dr. M.A. Chitale) submitted its report on 'Preparation of Guidelines for Works on De-siltation** from Bhimgauda (Uttarakhand) to Farakka (West Bengal) of river Ganga' to the Ministry of Water Resources, River Development and Ganga Rejuvenation in May 2017.
- The terms of reference of the Committee included: (i) establishing the need for desilting for ecology and flow of river Ganga, and (ii) forming guidelines for works on de-siltation of river Ganga. Key observations and recommendations of the Committee include:
- De-siltation and ecology: The Committee noted that siltation is a natural phenomenon in rivers. However, factors such as heavy rainfall, deforestation, structural interventions and enclosure of water in reservoirs increases the rate of siltation in rivers. Siltation results in the reduction in the carrying capacity of rivers and results in floods and loss of created useful storage. Desilting is the removal of fine silt and sediment that has collected in a river in order to restore its natural capacity, without widening or deepening of the river. De-siltation works have the potential to improve the hydraulic performance of a river. However, indiscriminate desilting can cause adverse impacts on a river's ecology and flow.
- Principles for de-siltation works: The Committee proposed basic principles for planning and execution of de-siltation works in rivers. These include:

- Catchment area treatment and watershed development activities, along with suitable agricultural practices and river bank protection/anti-erosion activities are necessary to reduce silt inflow into the river system and must be undertaken in a comprehensive manner;
- Erosion, movement and deposition of sediment in a river occur naturally. Arrangements should be made to pass the incoming sediment into a river to downstream of the dams/ barrage structures to maintain the sediment equilibrium;
- Dredging (desilting) should generally be avoided. The de-siltation quantity should not exceed the deposition rate, i.e., the amount of boulders, pebbles, and sand deposited in river bed minus the amount transported downstream each year;
- Rivers should be provided with sufficient corridor for meandering without any hindrance to their flow; and
- Precautions must be taken to avoid deposition of sediment loads within the river, and instead they should be deposited on other suitable land.

- Guidelines for de-siltation works: For better assessment and management of de-siltation works, the Committee recommended some measures that should be undertaken:

- Sediment transport (sediment transported through the basin of the river) processes must be studied along with establishing annual sediment budgets to guide desilting activities; and
- A technical institute must be entrusted to prepare the sediment budget, and flood routing studies to substantiate the necessity of undertaking desilting activities.

- De-siltation works in river Ganga: With regard to river Ganga, some of the guidelines suggested by the Committee include:

- The river should be provided with sufficient area for flood plain and lakes along it to moderate the flood level. Any encroachment of flood plain, and reclamation of lakes should be avoided. Instead, adjoining lakes should be desilted to increase their storage capacities.

- In cases when constriction works (e.g., barrages/bridges) cause large scale siltation, de-siltation along a pre-selected channel can be undertaken to deepen the river flow, thus guiding its main course of flow. The dredged material can be dumped along an alternate channel.

What is De-siltation?

- Silts are earthy matter, fine sand, or the like carried by moving or running water and deposited as a sediment, removal of such silts for the proper flow of river is known as desilting.
- The basic reasons given for the necessity of desilting are **increasing the storage capacity and checking eutrophic conditions.**
- What is done in the name of desilting is practically digging or excavation of lake bed.
- Increasing storage capacity by digging lake bed is the most costly proposal when compared to other alternatives.
- Desilting, if not done in a planned way, **creates isolated pits of considerable size** in the submergence area which may have lower bottom levels than the main storage.
- Thus, desilting said to be carried out for increasing storage capacity, practically reduces the actual utilizable storage in most of the cases.

What are the key findings of the report?

- The committee in its report says erosion, sediment transport and siltation are very complex phenomena.
- It is **impossible to apply a one-size-fits-all approach** to sediment management and control, because the issues involved are frequently very regionally-specific.
- Local factors such as topography, river control structures, soil and water conservation measures, tree cover, and riparian land-use or land disturbance can have a large impact on sediment loads in rivers.
- River control structures (such as reservoirs), soil conservation measures and sediment control programmes can cause downstream sediment loads to decrease, while factors such as land disturbance or agricultural practices can cause increased sediment loads.

Puneet Bhatia

LUMPY SKIN DISEASE

WHY IN THE NEWS?

There has been a recent spread of the infectious Lumpy Skin Disease among the cattle which is spreading to a more wider areas with several regions getting affected by it. It has already taken the lives of around 5000 cattle's in the last one month.

What is Lumpy Skin Disease?

1. Lumpy Skin disease is a viral disease of domestic cattle, water buffalo and certain wild ruminants.
2. Incubation of LSD period is around 28 days but experimentally affected cattle may develop clinical signs in 6 to 9 days.
3. It heavily impacts animal health and welfare and can lead to severe economic losses to the farmers in affected farms.

WHAT COULD BE THE SOURCES OF TRANSMISSION

- Lumpy skin disease is primarily spread between animals by biting insects (vectors) such as biting flies and mosquitoes.

SYMPTOMS OF LUMPY SKIN DISEASE

- The animal stops eating and faces several problems while eating or chewing which results in reduced milk production.
- It primarily consists of fever, fluid excretion from eyes and nose, dribbling of saliva from the mouth and blisters on the body.

CAUSES OF LUMPY SKIN DISEASE:

1. LSD is caused by infection of the water buffalo or cattle with the poxvirus Lumpy Skin Disease Virus (LSDV).
2. Lumpy skin disease was first seen as an epidemic in Zambia in 1929.
3. According to the FAO the mortality rate is less than 10%.

WHAT ARE THE PREVENTIVE AND TREATMENT MEASURES

1. Vaccination of the Lumpy Skin Disease is covered under the Livestock Health and Disease Control Programme of India.
2. Vaccination could be done through the indegenious vaccines like Lumpi-ProVaxInd.
3. Anti-inflammatory painkillers can also be used in order to keep the apatite of the affected animal high.
4. The supportive care of the cattle is needed because the their are no anti viral drugs which are available.
5. This can include treatment of skin lesions using wound care sprays and the use of antibiotics to prevent secondary skin infections and pneumonia.

Samarth Singh