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Quinine Nongladew

- Quinine Nongladew is a village named after the alkaloid quinine extracted from the bark of cinchona.
- Quinine, its most primitive antimalarial avatar.
- Cinchona is a plant belonging to the Rubiaceae family and classified as either a large shrub or a small tree.
- The village, is about 70 km south of Guwahati, is on the highway to Meghalaya capital Shillong.
- Meghalaya's Forests and Environment Department has no records on the Quinine Garden.
- The cinchona nursery was raised in the 19th century, probably around 1874, when Shillong became the British administrative headquarters for Assam Province.
- The nursery on an unknown area fell into disuse by the mid-1950s, the plantation was not much of a success at it involved an exotic species brought from South America.
- Large swathes of Meghalaya used to be, and still are, malaria-prone.
- The British had the foresight to start the plantation to combat malaria and other diseases caused by mosquitoes.
- One of the reasons is that the Forest Department has no control over the area where a few cinchonas grow uncared for.
- According to the Indian State of Forest Report 2019, Meghalaya has a forest cover of 76.32% of its geographical area.
- But the department lords over only 1,113 sq km forest area while the remaining 16,005.79 sq km is under community and private ownership.
- Forest Department have no jurisdiction over Quinine Garden or whatever is left of it.
- Recently the COVID-19 pandemic has generated interest among locals in the cinchona tree.
- The villagers also sniff commercial gain if quinine goes on to become a source of cure for the disease, which is incurable for now.

Cinchona Bark



Gharials

- Gharials or Gavials, are a type of Asian crocodilian distinguished by their long, thin snouts which resembles a pot.
- Their natural habitat is fresh waters of the northern part of India includes

1. **Primary Habitat -** Chambal River
2. **Secondary Habitat -** Ghaghra and Gandak river, Girwa river (Katarniaghat Wildlife Sanctuary in Uttar Pradesh), Ramganga river in Jim Corbett National Park and the Sone river.

- Population of Gharials are a good indicator of clean river water.
- Gharials are a type of Crocodilians that also includes crocodiles, alligators, caimans, etc.
- In comparison to Crocodiles, Gharials are very shy and unharmful species.
- Gharials are critically endangered in the International Union for Conservation of Nature Red List of Species.
- Listed under Schedule I of the Wild Life (Protection) Act, 1972.
- Listed on Appendix I of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Conservation Efforts includes

1. Breeding Centres of Kukrail Gharial Rehabilitation Centre in Lucknow, UP.
2. National Chambal Sanctuary (Gharial Eco Park, Madhya Pradesh).

- Major threats for Gharials includes

1. Gharials prefer sandbanks as suitable habitats, Wild animals as well as humans often destroy their eggs.
2. Increased river pollution, dam construction, massive-scale fishing operations and floods.
3. Illegal sand mining and poaching.

- Recently Government of Uttar Pradesh has released Gharials in the Ghaghara River for the conservation and protection in natural habitat.

Three important Crocodilias in India

1. **Mugger (or marsh) crocodile (Crocodylus palustris) -** Vulnerable

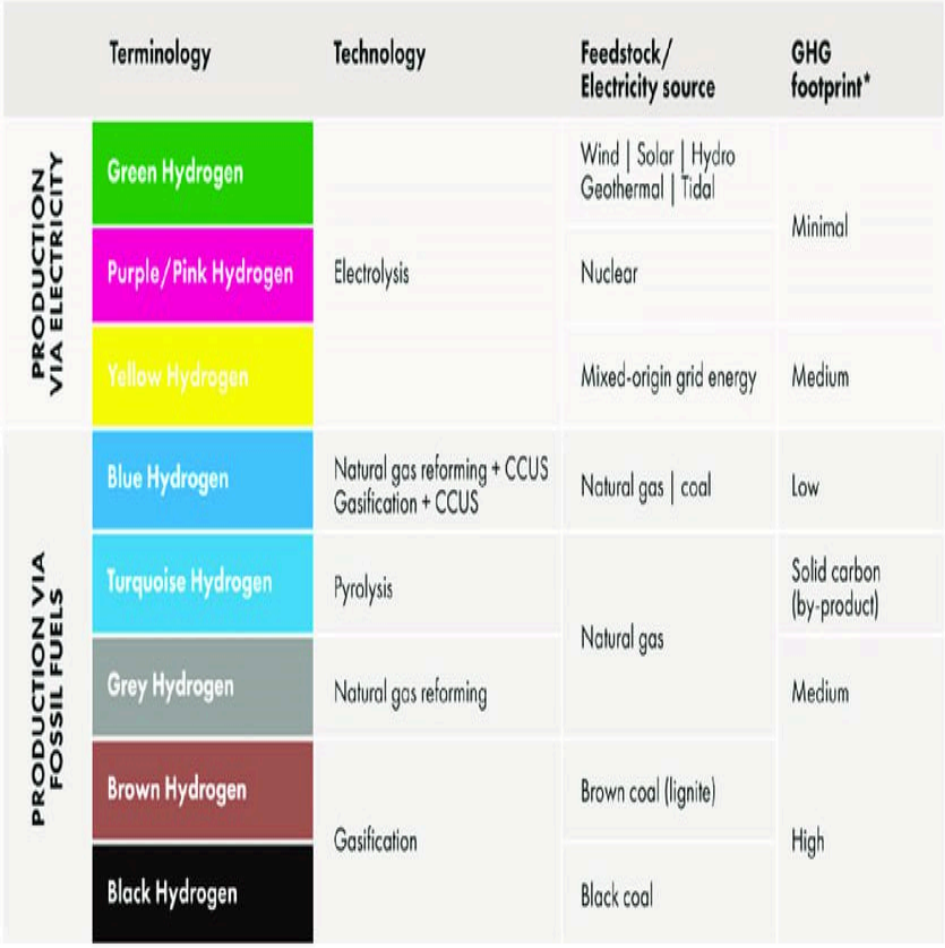
- The mugger crocodile is India's most common species - They are not as long as saltwater crocodiles.
- Their average size is about 13–14 feet, it is found in lakes and rivers throughout the country.

2. **Saltwater crocodile (C. porosus) -** Least Concern

- They are found in the eastern states of Odisha, West Bengal, Andhra Pradesh and Tamil Nadu, Nicobar and Andaman Islands.
- Saltwater crocodiles live in the mangroves of Bhittarkanika and Sunderbans, Mahanadi Delta, and in the swamplands in Odisha and West Bengal (including rivers).

3. **Gharial (Gavialis gangeticus)** - Critically Endangered.

- It is found in river areas, though is greatly reduced from its previous range.



	Terminology	Technology	Feedstock/ Electricity source	GHG footprint*
PRODUCTION VIA ELECTRICITY	Green Hydrogen	Electrolysis	Wind | Solar | Hydro Geothermal | Tidal	Minimal
	Purple/Pink Hydrogen		Nuclear	
	Yellow Hydrogen		Mixed-origin grid energy	Medium
PRODUCTION VIA FOSSIL FUELS	Blue Hydrogen	Natural gas reforming + CCUS Gasification + CCUS	Natural gas | coal	Low
	Turquoise Hydrogen	Pyrolysis	Natural gas	Solid carbon (by-product)
	Grey Hydrogen	Natural gas reforming		Medium
	Brown Hydrogen	Gasification	Brown coal (lignite)	High
	Black Hydrogen		Black coal	

*GHG footprint given as a general guide but it is accepted that each category can be higher in some cases.

Chambal River

- The Chambal originates at the Singar Chouri peak in the northern slopes of the Vindhya Mountains (Indore, Madhya Pradesh).
- It joins the Yamuna River in Etawah District of UP.
- Tributaries - Banas, Kali Sindh, Parbati.
- The National Chambal Sanctuary is located along river Chambal on the tri-junction of Rajasthan, Madhya Pradesh and Uttar Pradesh.
- It is known for critically endangered gharials, the red-crowned roof turtle, and the endangered Ganges river dolphin.

Ghaghara River

- It acts as an important aquatic corridor for gharials in Uttar Pradesh.
- Its source is near Gurla Mandhata peak, south of Mansarovar in Tibet.
- It is known as the Karnaili in Western Nepal.
- It's important tributaries are the Sarda, the Sarju (Ayodhya is located on its bank) and the Rapti.
- The Ghaghara joins the Ganga a few kilometres downstream of Chhapra in

Bihar.

- After reaching the plain area, its stream gets divided into many branches of which, Koriyab and Garwa are important.
- The river bed is sandy and sudden bends start occurring in the stream.

SAMARTH ERP

- The Ministry of Human Resource Development (HRD) has developed an e-governance platform 'SAMARTH Enterprise Resource Planning (ERP)' under the National Mission of Education in Information and Communication Technology Scheme (NMEICT).
- SAMARTH ERP is an open source, open standard enabled robust, secure, scalable, and evolutionary process automation engine for Universities and Higher Educational Institutions.
- Enterprise Resource Planning (ERP) refers to a type of software used to manage day-to-day business activities such as accounting, procurement, project management, risk management and compliance, and supply chain operations.
- ERP in a University can improve management and administration.
- The platform has been implemented at the National Institute of Technology (NIT), Kurukshetra, a participating unit under the World Bank-supported Technical Education Quality Improvement Program (TEQIP).

National Mission on Education through Information and Communication Technology

- The Mission, launched in 2009, is a landmark initiative of the Ministry of Human Resource Development (MHRD), with the objective of seamlessly providing quality educational content to all the eligible and willing learners in India.
- It has been envisaged to leverage the potential of ICT, in the teaching and learning process for the benefit of all the learners in Higher Education Institutions.
- Initiatives under the Program

1. **SWAYAM:** The Study Webs of Active Learning for Young Aspiring Minds' (SWAYAM) is an integrated platform for offering online courses, covering school (9th to 12th) to Postgraduate Level.
2. **SWAYAM Prabha -** It is an initiative to provide 32 High Quality Educational Channels through DTH (Direct to Home) across the length and breadth of the country on a 24X7 basis.

3. **National Digital Library of India (NDL) -** It is a project to develop a framework of virtual repository of learning resources with a single-window search facility.
4. **Spoken Tutorial -** They are 10-minute long, audio-video tutorials, on open source software, to improve employment potential of students.
5. **Free and Open Source Software for Education (FOSSEE) -** It is a project promoting the use of open source software in educational institutions.
6. **E-Yantra -** It is a project for enabling effective education across engineering colleges in India on embedded systems and robotics.

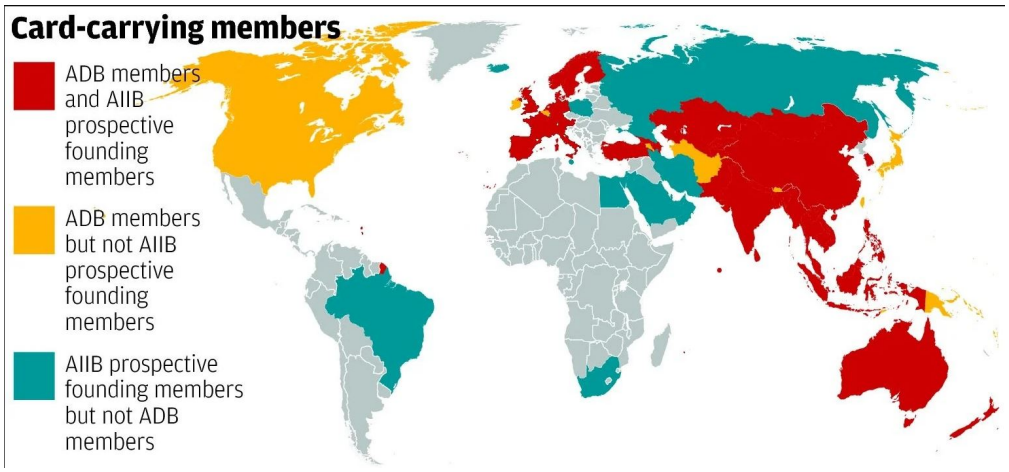
Technical Education Quality Improvement Programme

- It was started in 2002 by the Ministry of Human Resources and Development with the assistance of the World Bank and is being implemented in a phased manner .
- It aims to upscale the quality of technical education and enhance capacities of institutions.
- The Technical Education Quality Improvement Programme III (TEQIP-III) was started in 2017 and will be completed by 2021.
- It aims to develop technical education as a key component for improving the quality of Engineering Education.
- The Objective is to improve quality and equity in engineering institutions in focus states such as in low income states.

Asian Infrastructure Investment Banks

- The Asian Infrastructure Investment Bank (AIIB) is a multilateral development bank that aims to support the building of infrastructure in the Indo-Pacific region.
- The bank currently has 78 members as well as 24 prospective members from around the world.
- The bank was proposed by China in 2013 and the initiative was launched at a ceremony in Beijing in October 2014.
- It received the highest credit ratings from the three biggest rating agencies in the world, and is seen as a potential rival to the World Bank and IMF.
- The bank started operation after the agreement entered into force in 2015, after ratifications were received from 10 member states holding a total number of 50% of the initial subscriptions of the Authorized Capital Stock.

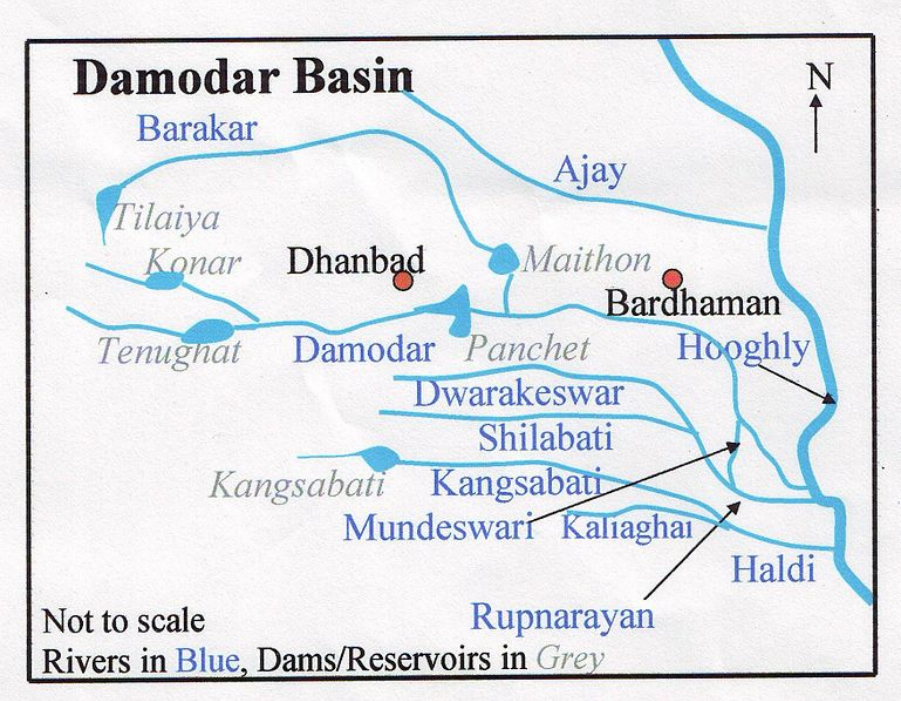
- Government of India, West Bengal Government and the Asian Infrastructure Investment Bank, signed a loan agreement for a 145 million dollar project to improve irrigation services and flood management in the Damodar Valley Command Area in West Bengal.
- The project will assist in improving irrigation and agriculture in the Damodar Valley Command Area, by optimizing the use of surface and groundwater.
- It will also strengthen flood management, which will help boost agricultural productivity and increase incomes in rural areas.



Damodar River

- Damodar River is a river flowing across the Indian states of Jharkhand and West Bengal.
- Rich in mineral resources, the valley is home to large-scale mining and industrial activity.
- Earlier known as the Sorrow of Bengal because of its ravaging floods in the plains of West Bengal, the Damodar and its tributaries have been somewhat tamed with the construction of several dams.
- It has a number of tributaries and subtributaries, such as Barakar, Konar, Bokaro, Haharo, Jamunia, Ghari, Guaia, Khadia and Bhera.
- The Damodar and the Barakar trifurcates the Chota Nagpur plateau.
- The rivers pass through hilly areas with great force, sweeping away whatever lies in their path.
- The Damodar valley is rich in coal, It is considered as the prime center of coking coal in the country.
- The important coalfields in the basin are Jharia, Raniganj, West Bokaro, East Bokaro, Ramgarh, South Karanpura and North Karanpura.
- The Damodar Valley is one of the most industrialised parts of India.
- Three integrated steel plants (Bokaro, Burnpur and Durgapur) of Steel

Authority of India Limited (SAIL) and other factories are in the valley.



Global Forest Resources Assessment 2020

- Global Forest Resources Assessment is a report released by the United Nations Food and Agriculture Organization (FAO).
- The FRA 2020 has examined the status of, and trends in, more than 60 forest-related variables in 236 countries and territories in the period 1990–2020.
- According to recent report estimates Africa had the largest annual rate of net forest loss in 2010–2020, at 3.9 mha, followed by South America, at 2.6 mha.
- On the other hand, Asia had the highest net gain of forest area in 2010–2020, followed by Oceania and Europe.
- The largest proportion of the world's forests were tropical (45 per cent), followed by boreal, temperate and subtropical.
- More than 54 per cent of the world's forests were in only five countries the Russian Federation, Brazil, Canada, the United States of America and China.
- The highest per cent of plantation forests were in South America while the lowest were in Europe.
- **The highlights of the report are as follows**
    1. Forest area has declined all across the world in the past three decades.
    2. The world lost 178 mha of forest since 1990, an area the size of Libya.

3. The rate of forest loss has also declined due to the growth of sustainable management.
4. The rate of forest loss in 2015-2020 declined to an estimated 10 million hectares (mha), down from 12 million hectares (mha) in 2010-2015.
5. The area of naturally regenerating forests worldwide decreased since 1990, but the area of planted forests increased by 123 mha.
6. The world's total forest area was 4.06 billion hectares (bha), which was 31 per cent of the total land area, This area was equivalent to 0.52 ha per person.

Food and Agriculture Organization

- The Food and Agriculture Organization of the United Nations (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger and improve nutrition and food security.
- Founded in October 1945, the FAO is the oldest existing agency of the U.N.
- The FAO is headquartered in Rome, Italy and maintains regional and field offices around the world, operating in over 130 countries.
- It helps governments and development agencies coordinate their activities to improve and develop agriculture, forestry, fisheries, and land and water resources.
- It also conducts research, provides technical assistance to projects, operates educational and training programs, and collects data on agricultural output, production, and development.

Source: The Hindu. Down To Earth, News on Air

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