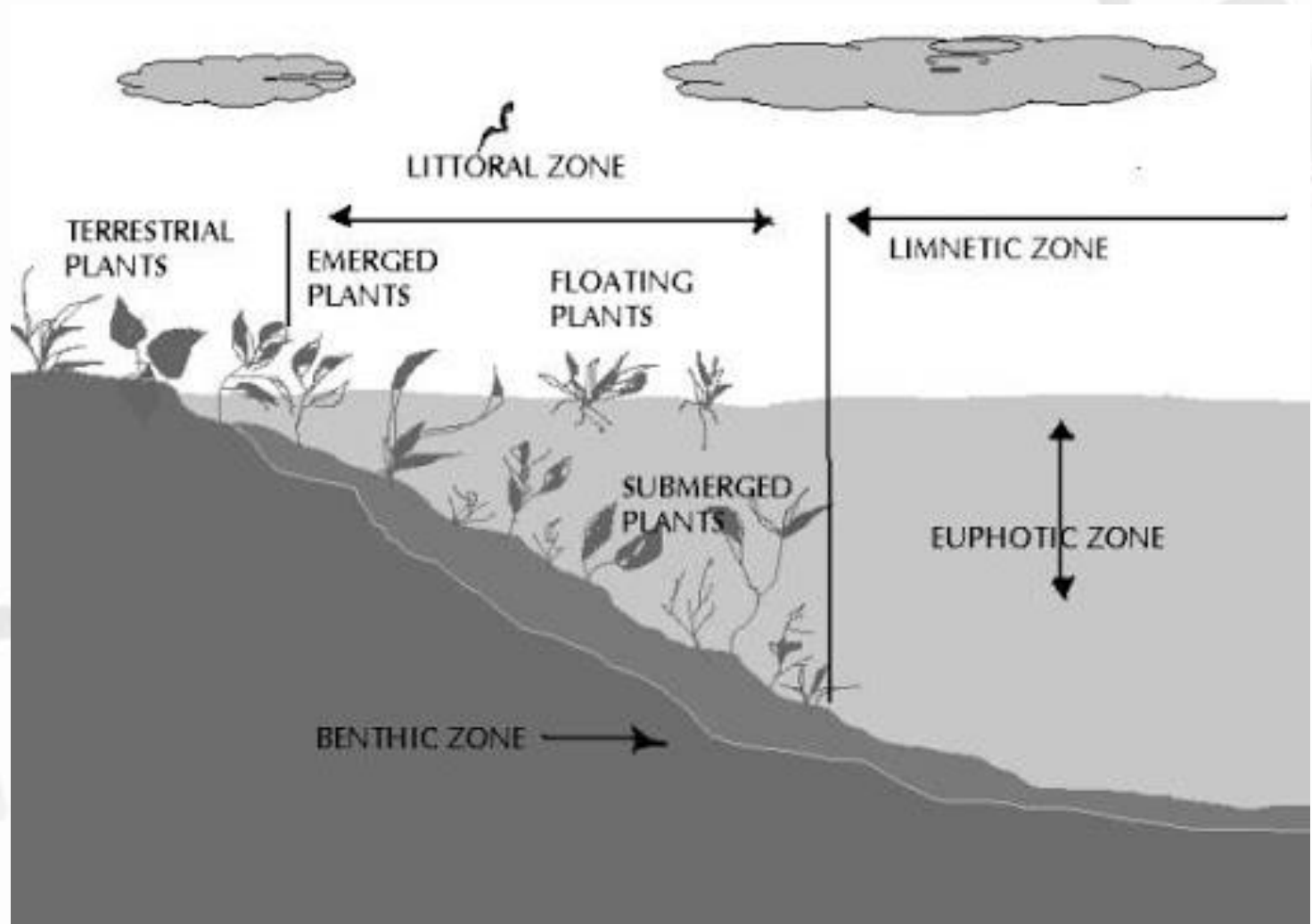


Mangroves

Sudarshan Gurjar

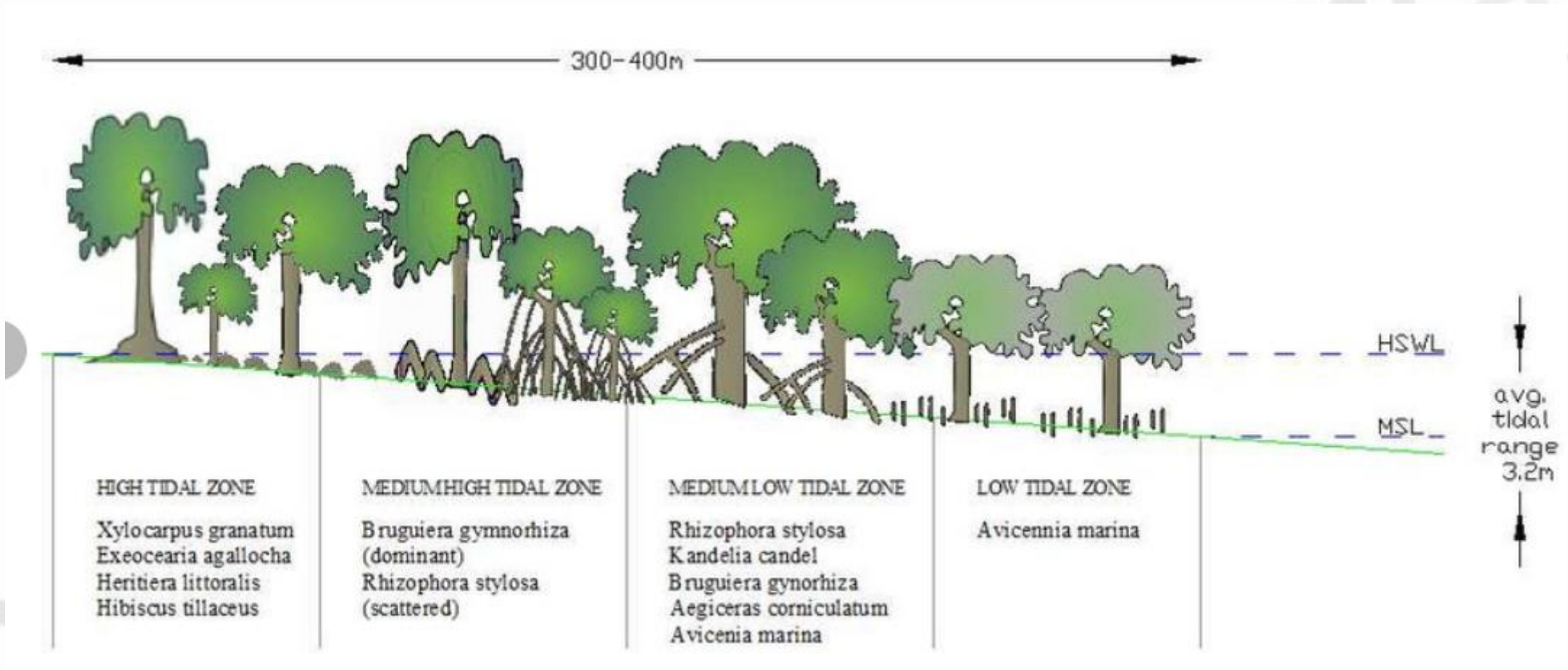
Mangroves

- Mangroves represent a characteristic littoral तटीय (near the seashore) forest ecosystem.
- These are mostly evergreen forests that grow in sheltered low lying coasts, estuaries, mudflats, tidal creeks backwaters (coastal waters held back on land), marshes and lagoons of tropical and subtropical regions.
- Mangroves are **highly productive ecosystems**, and the trees may vary in height from 8 to 20 m. They protect the shoreline from the effect of cyclones and tsunamis.
- मैंग्रोव वनस्पति एक ऐसा पारिस्थितिक तंत्र है जहां स्थलीय और समुद्री पारिस्थितिक तंत्र के बीच सहजीवी संपर्क या सेतु का कार्य होता है



- Since mangroves are located between the land and sea, they represent the best example of **ecotone**. **संक्रमिका**
- Mangroves are salt tolerant trees, also called **halophytes** **लवणमृदोद्भिद**, and are adapted harsh coastal conditions.
- They are adapted to the **low oxygen (anoxic)** conditions of waterlogged mud.
- They produce **pneumatophores** **श्वासन-सूत्र** (**blind roots**) to overcome the respiration problem in the **anaerobic soil** conditions. **अवायवीय**
- Mangrove vegetation **facilitates more water loss**.
- Mangroves occur worldwide in the **tropics and subtropics**, mainly between latitudes 25° N and 25° S.

- Mangroves grow **below the high water level of spring tides.**



Red Mangrove (*Rhizophora mangle*)

- Mangroves occur in a variety of configurations. Some species (e.g. *Rhizophora*) send arching prop roots down into the water.

- स्तम्भ मूल

अवस्तम्भ मूल (stilt roots):



- While other (e.g. *Avicennia*) send vertical “Pneumatophores” or air roots up from the mud.



- **न्यूमेटाफीर (Pneumataphore):** राइजोफोरा (Rhizophora), सुन्दरी (Sundari) आदि पौधे जो दलदली स्थानों पर उगते हैं, में भूमिगत मुख्य जड़ों से विशेष प्रकार की जड़ें निकलती हैं, जिसे न्यूमेटाफोर कहते हैं। ये खूंटी के आकार की होती हैं, जो ऊपर वायु में निकल आती हैं। इनके ऊपर अनेक छोटे-छोटे छिद्र होते हैं जिन्हें न्यूमेथोडस (Pneumathodes) कहते हैं। जैसे- राइजोफोरा, सुन्दरी आदि।

Heritiera littoralis





- Mangroves exhibit **Viviparity mode of reproduction**. i.e. **seeds germinate in the tree itself** (before falling to the ground).
- the seed germinates and grows from its own resources while still attached to its parent.
- Vivipary
- जरायुजता



ECOSYSTEM SERVICES

The benefits people derive from mangroves



Wood

Its density makes mangrove wood a valued source of **timber and fuel**



Livelihoods

120 million people living near mangroves¹



Mangrove ecosystem services

Worth US\$ 33,000–57,000 per hectare per year¹
x 14 million hectares²
= up to **US\$ 800 billion** per year



Climate regulation

Carbon storage potential of mangroves is **3–5x higher** than that of tropical upland forest due to strong carbon storage in the soil³; CO₂ released by global mangrove loss annually could be as high as the annual emissions of Australia⁴⁻⁵



Coastal protection

Restoring mangroves for coastal defence up to **5 times more** cost-effective than “grey infrastructure” such as breakwaters⁹



Water filtration

2–5 hectares of mangroves may treat the effluents of **1 hectare** of aquaculture⁸



Tourism

There are over **2,000** mangrove-related attractions globally, such as boat tours, boardwalks, kayaking and fishing⁷



Fisheries

More than **3000 fish species** are found in mangrove ecosystems⁶



Federal Ministry
for Economic Cooperation
and Development

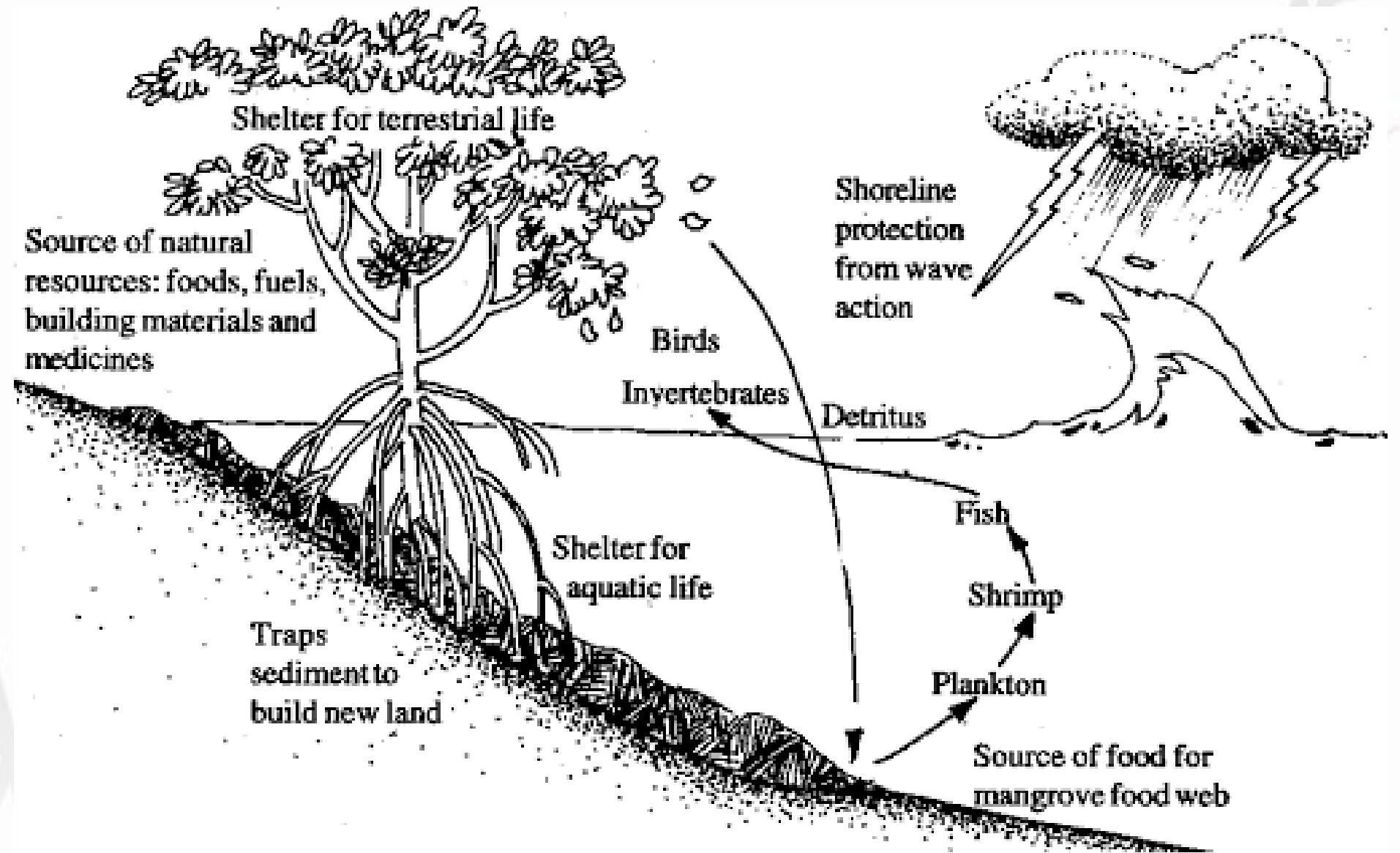


WWF



IUCN







1) Subarnarekha

2) Bhitarkanika

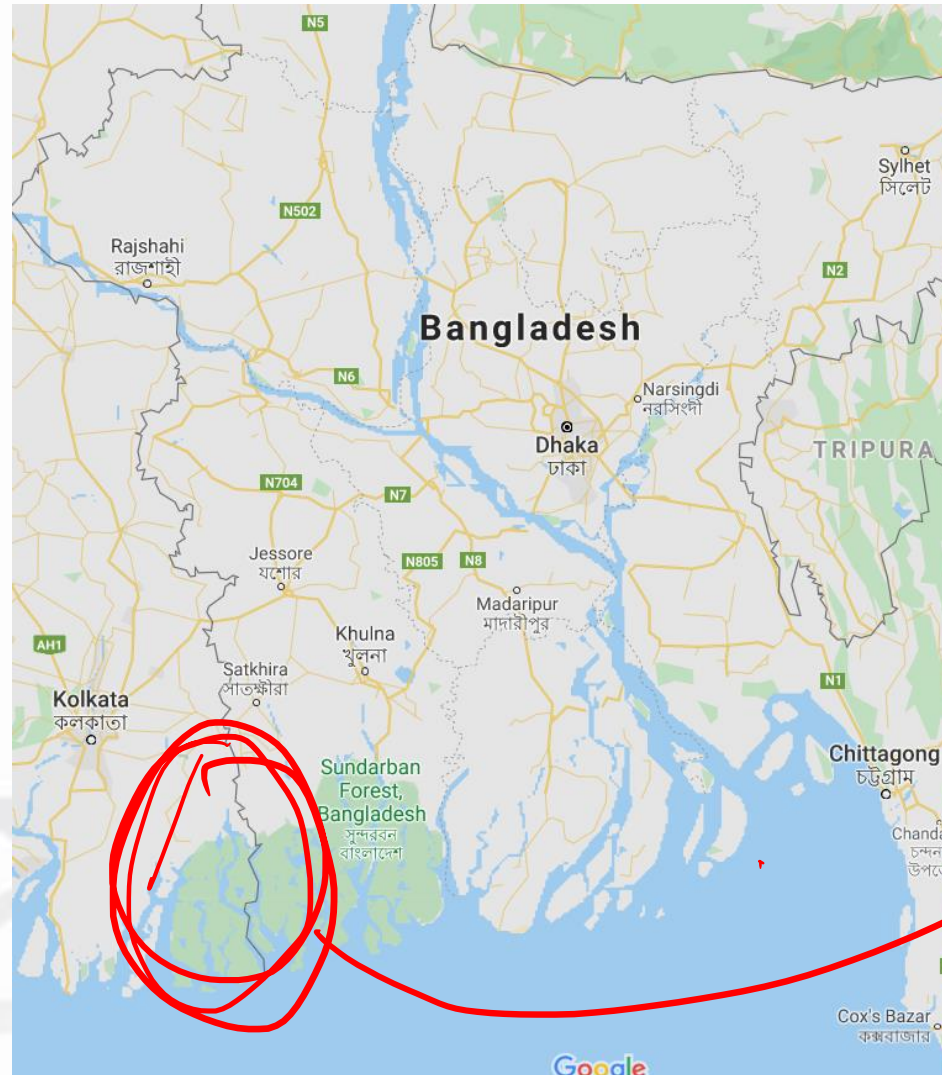
(3) Dhamra

5) Mahanadi

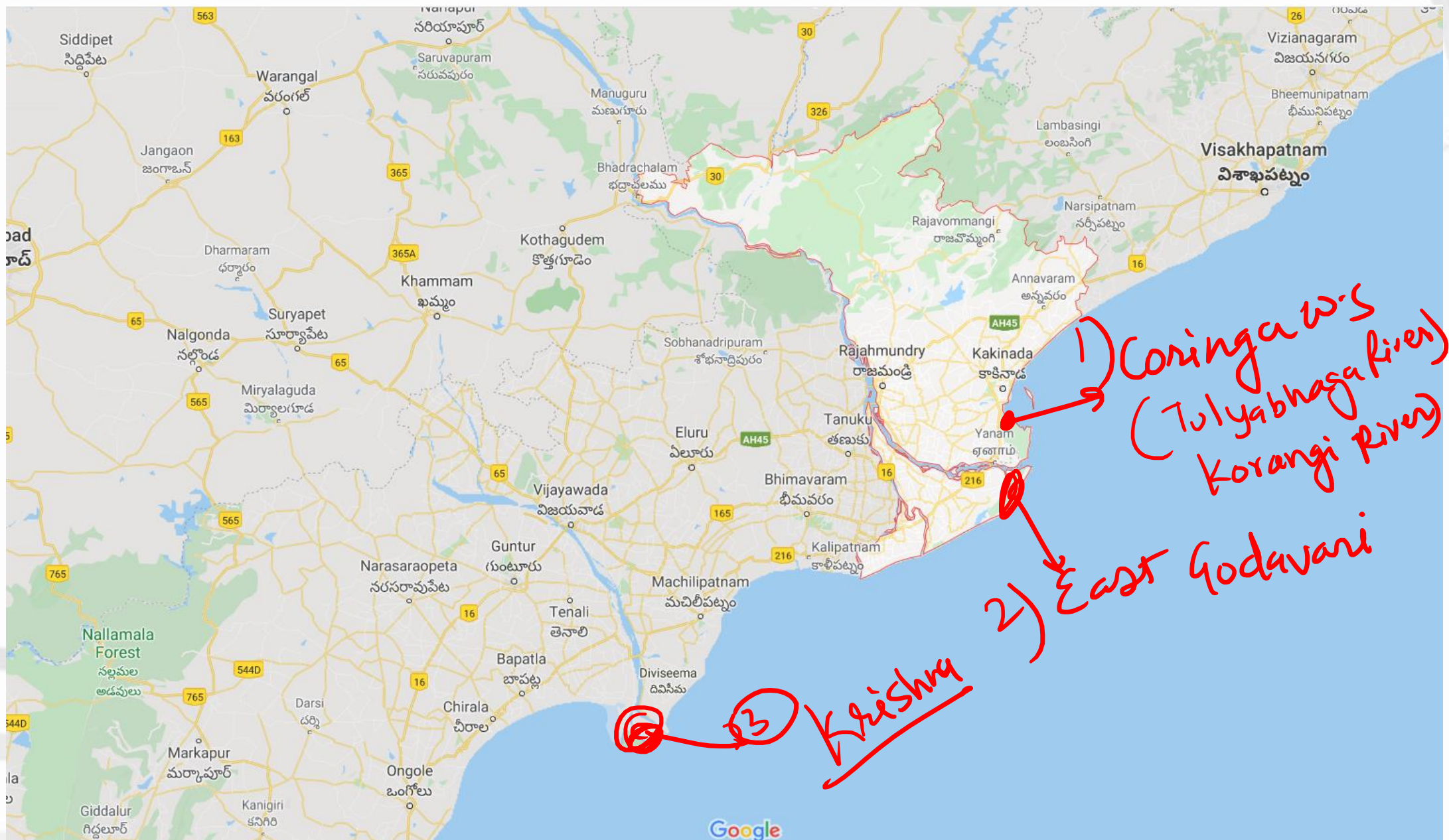
(4) Mangrove Genetic Resources Centre (Kalibhanjdia Island)

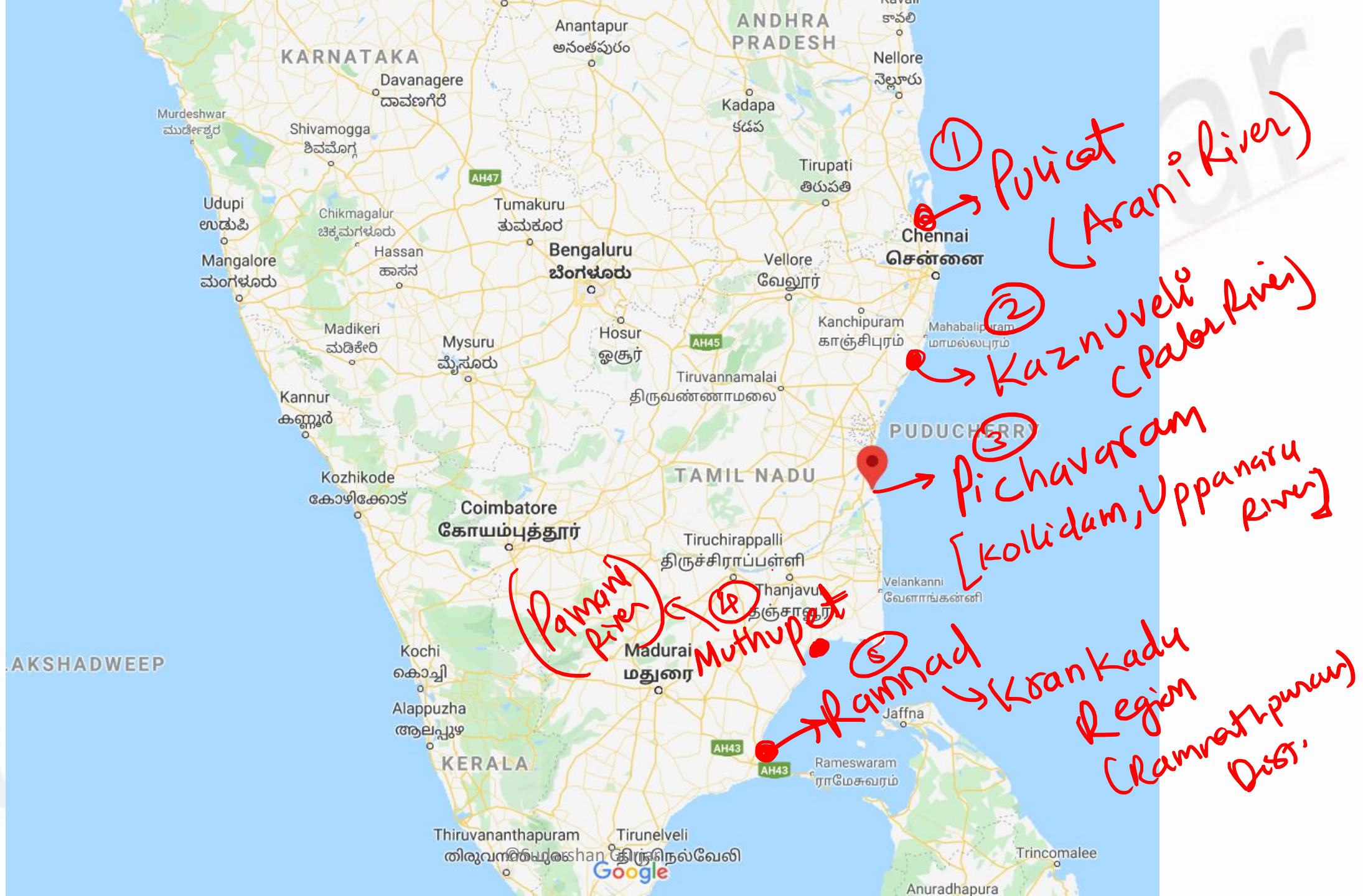
6) Devi-Kauda

7) Chilka Lake Region



Sundarbans





Subashgram
Mayabunder
Adazig
ANDAMAN
AND NICOBAR
ISLANDS

North Andaman

Perka

Kalasi

Mohean

Anul

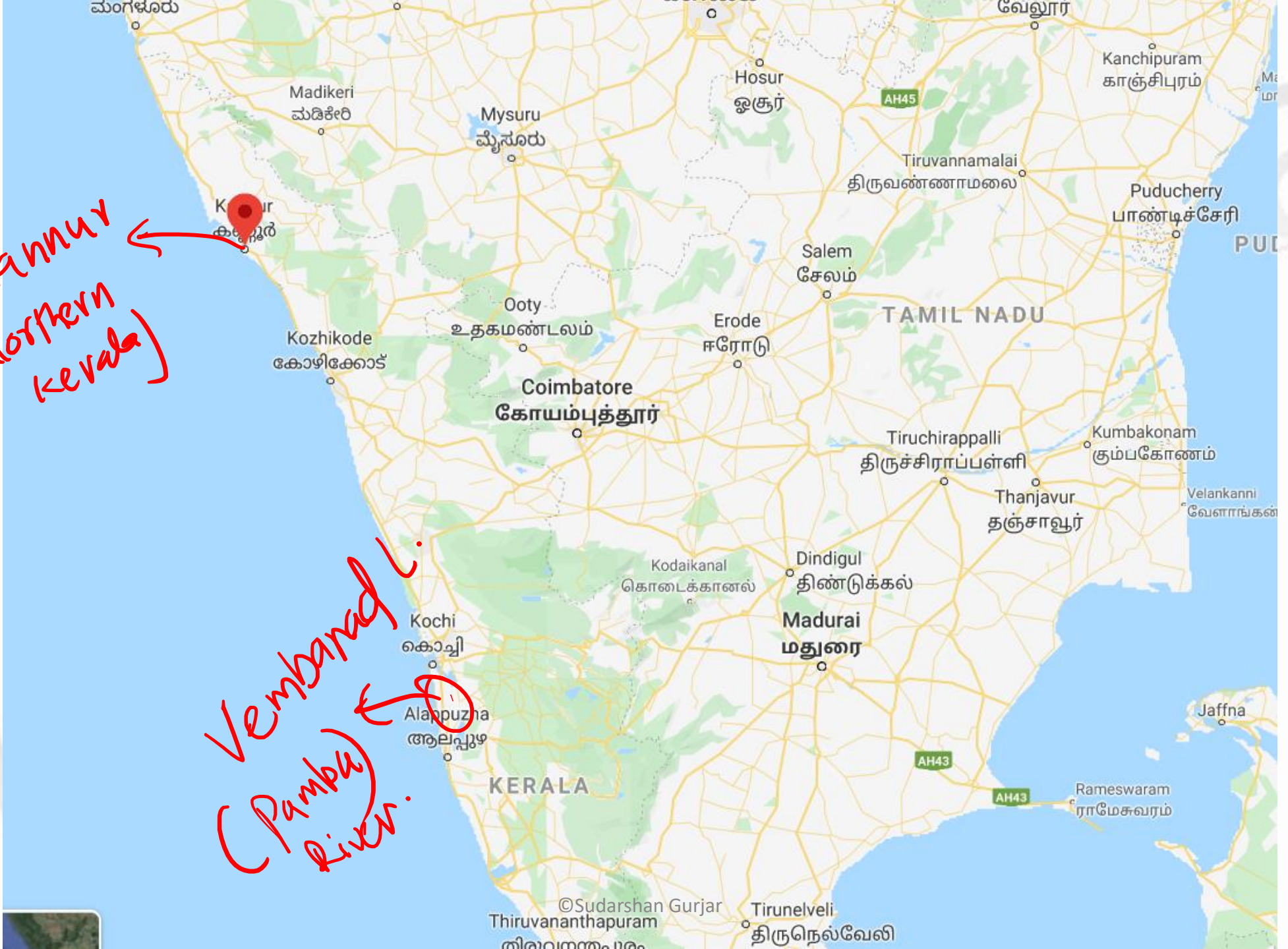
Campbell Bay

Indira Point

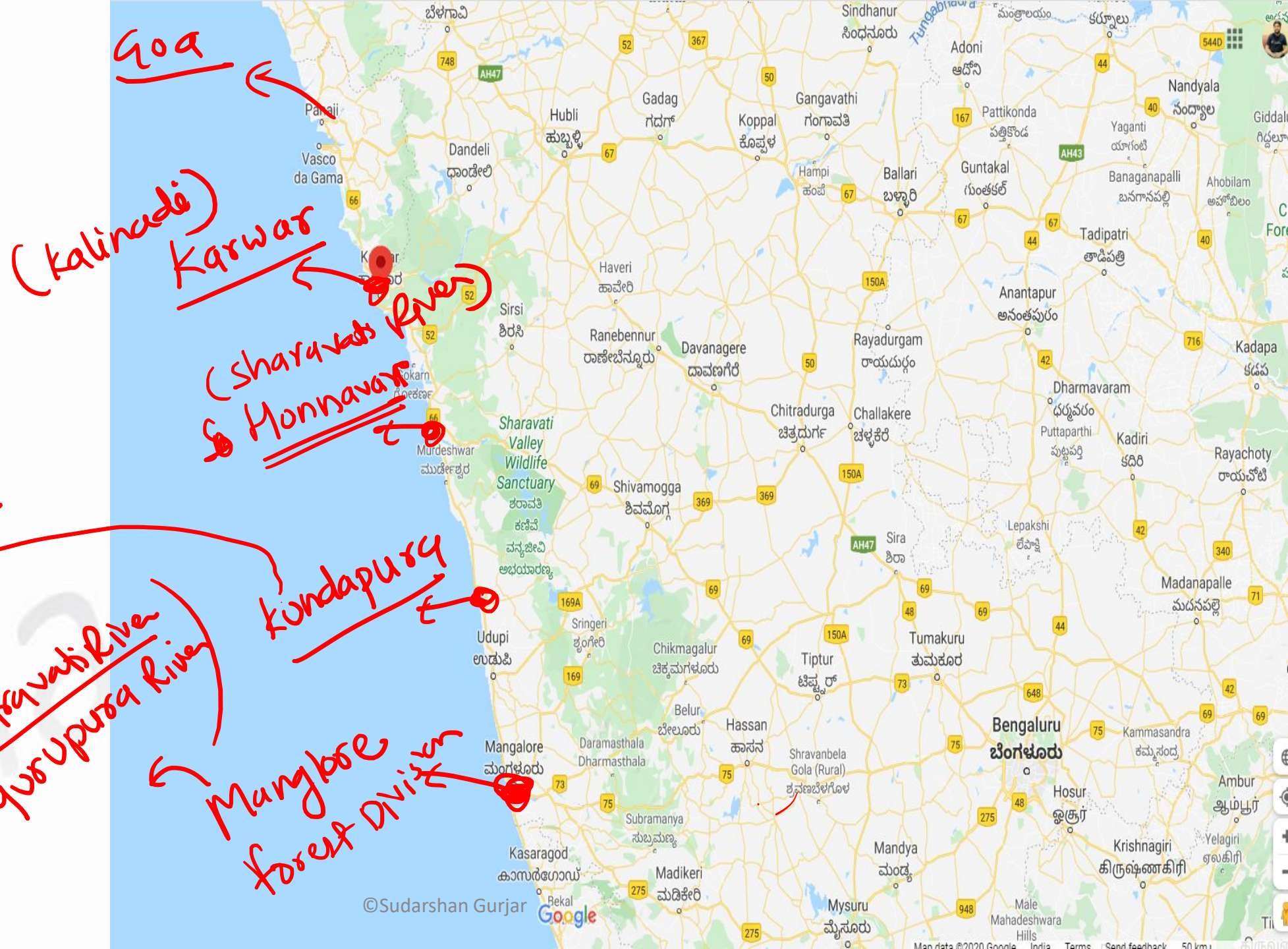
Nicobar

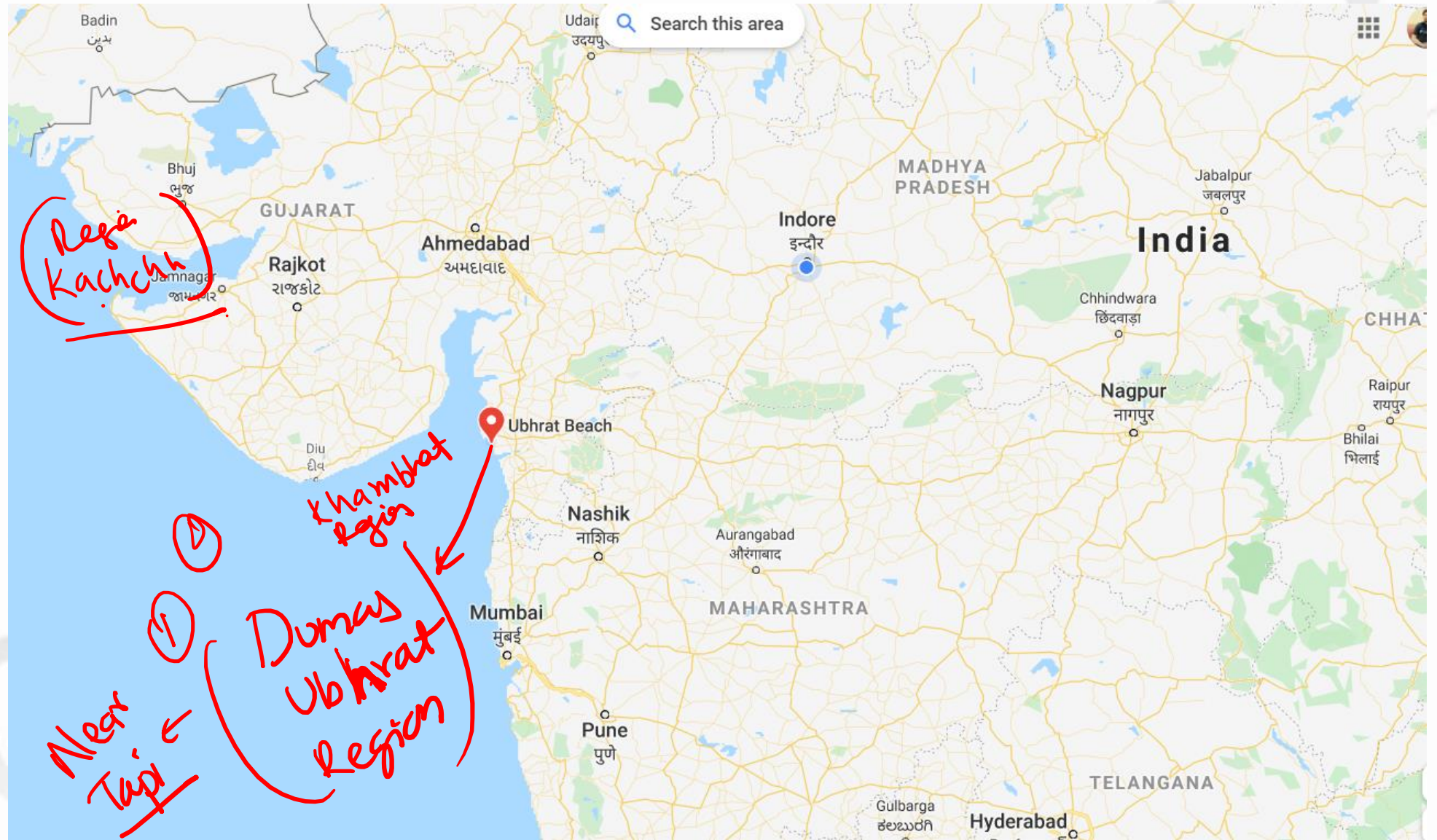
Kannur
(Northern
Kerala)

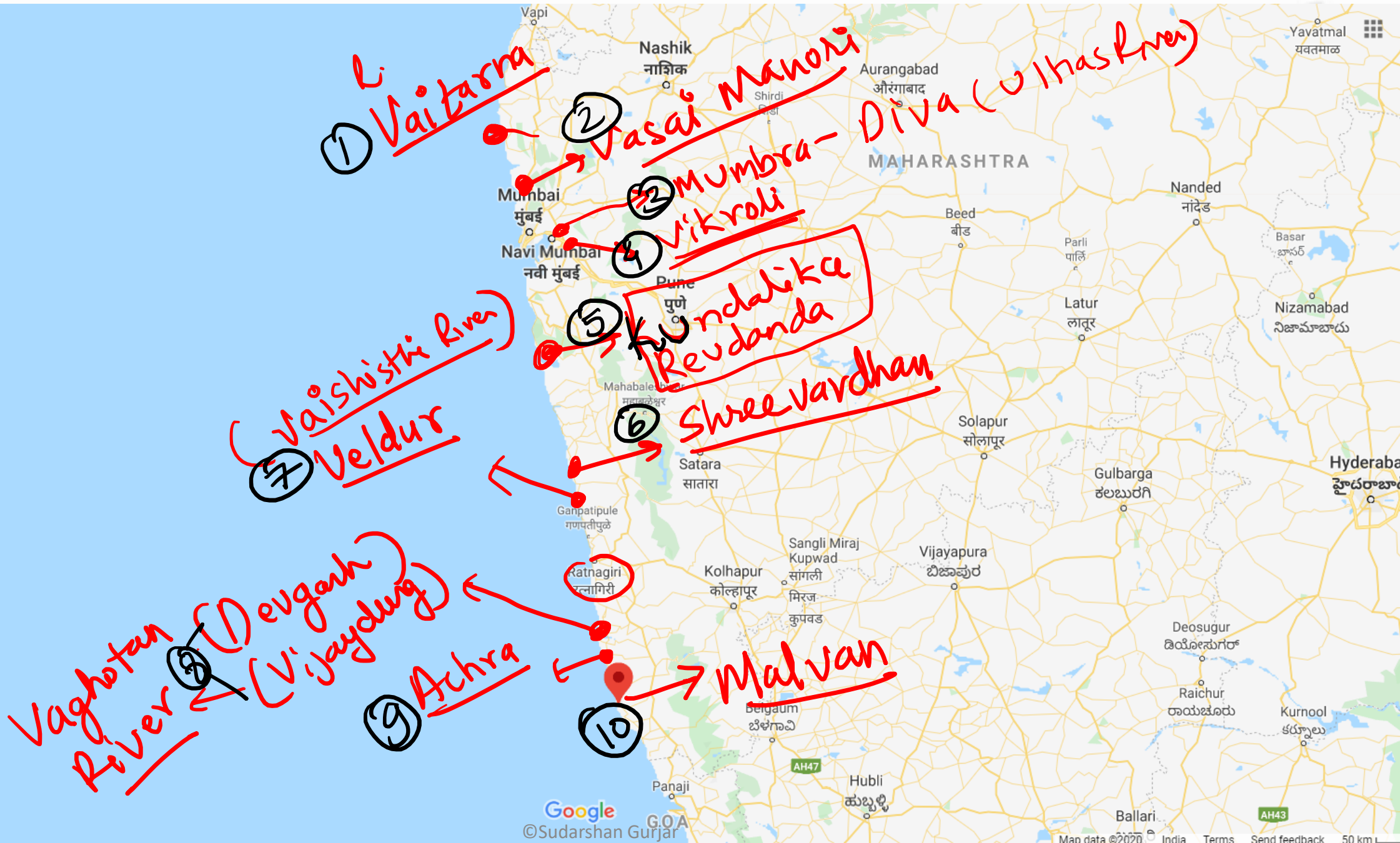
Vembanad
(Pamban
River)



1. Panchganguvali d.
2. Chakra River
3. Kolluru River







Importance of Mangroves

- Mangrove plants have (additional) special roots such as prop roots, pneumatophores which help to impede water flow and thereby enhance the **deposition of sediment in areas** (where it is already occurring), stabilise the coastal shores, provide a breeding ground for fishes.
- Mangroves moderate monsoonal tidal floods and reduce inundation of coastal lowlands.
- They prevent coastal soil erosion.
- They protect coastal lands from tsunami, hurricanes and floods.
- Mangroves enhance the natural recycling of nutrients.
- Mangrove supports numerous floras, avifauna and wildlife.
- Provide a safe and favourable environment for breeding, rearing of several fishes.
- They supply woods, firewood, medicinal plants and edible plants to local people.
- They provide numerous employment opportunities to local communities and augments their livelihood.

- Mangroves for the Future (MFF) Established in 2006
- भविष्य के लिए मैंग्रोव

Mangroves for the Future (MFF) is a unique partner-led initiative to promote investment in coastal ecosystem conservation for sustainable development.

- Co-chaired by IUCN and UNDP, MFF provides a platform for collaboration among the many different agencies, sectors and countries which are addressing challenges to coastal ecosystem and livelihood issues.
- The goal is to promote an integrated ocean-wide approach to coastal management and to building the resilience of ecosystem-dependent coastal communities.
- **Member countries:** Bangladesh, Cambodia, India, Indonesia, Maldives, Myanmar, Pakistan, Seychelles, Sri Lanka, Thailand, and Viet Nam

- **Objectives:** To achieve its goal of conservation, restoration and sustainable management of coastal ecosystems as key natural infrastructure which support human well-being and security, MFF implements actions guided by three main objectives.
 - 1.Improve, share and apply knowledge to support the conservation, restoration and sustainable use of coastal ecosystems.
 - 2.Strengthen Integrated Coastal Management institutions and empower civil society (including local communities) to engage in decision-making and management that conserves, restores and sustainably uses coastal ecosystems.
 - 3.Enhance coastal governance at all levels (regional, national, provincial, district and community) to encourage integrated management programmes and investments that are ecologically and socio-economically sound, and promote human well-being and security.