

The Bengal Tiger of the Sundarbans: Conserving Endangered Species to conserve Ecosystem Services threatened by Climate Change and Human Activity

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The Bengal Tiger

Population of the *Panthera tigris tigris* subspecies.

- Life Span: 10-15 years
- Size: 8-10 feet, 4 feet at shoulder
- Weight: 500-600 lbs
- Jump: 20-30 feet
- Top speed: 60 miles/h

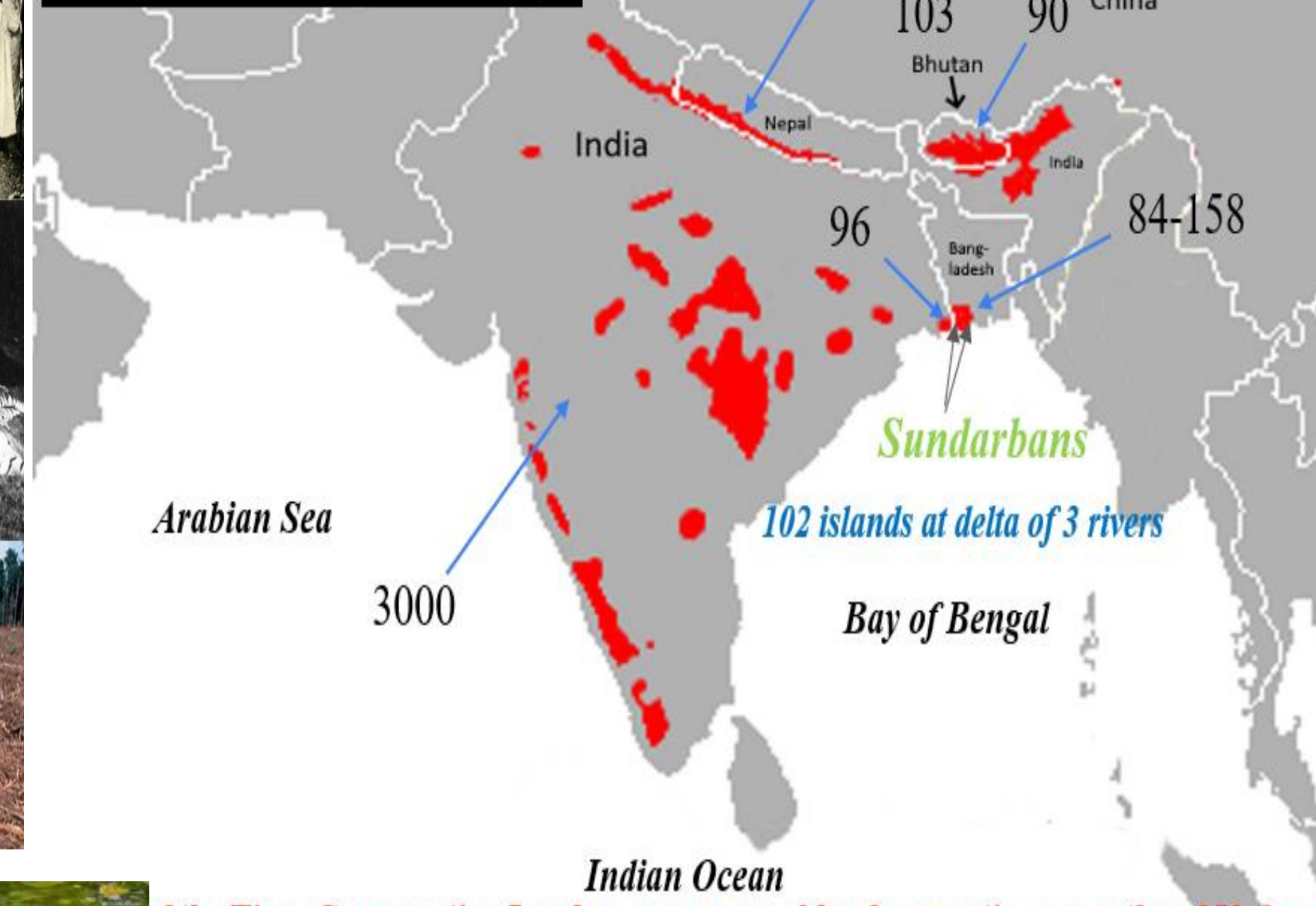


The Bengal Tiger

- 1900: 100,000 (believed)
- 1947: 40,000
- 1972: 1,827 (estimated)
- 1973: Project Tiger
- 1990: 3,500
- 2006: 1400 (counted)
- 2019: 2,967
- 2023: 3,100



Current Range



- World's largest mangrove forest:
 - 10,000 sq. km.
- Managed by India and Bangladesh.
- Comprise 102 islands formed by delta of Ganges, Brahmaputra, and Meghna Rivers.
- Sundarban Tiger Reserve has largest population of Bengal Tigers worldwide.
- UNESCO Biosphere Reserve since 2001
- Laws exist but lack enforcement.
 - Indian Forest Act, 1927; Forest Conservation Act, 1980;
 - Wildlife Protection Act, 1972; Environment Protection Act, 1986.

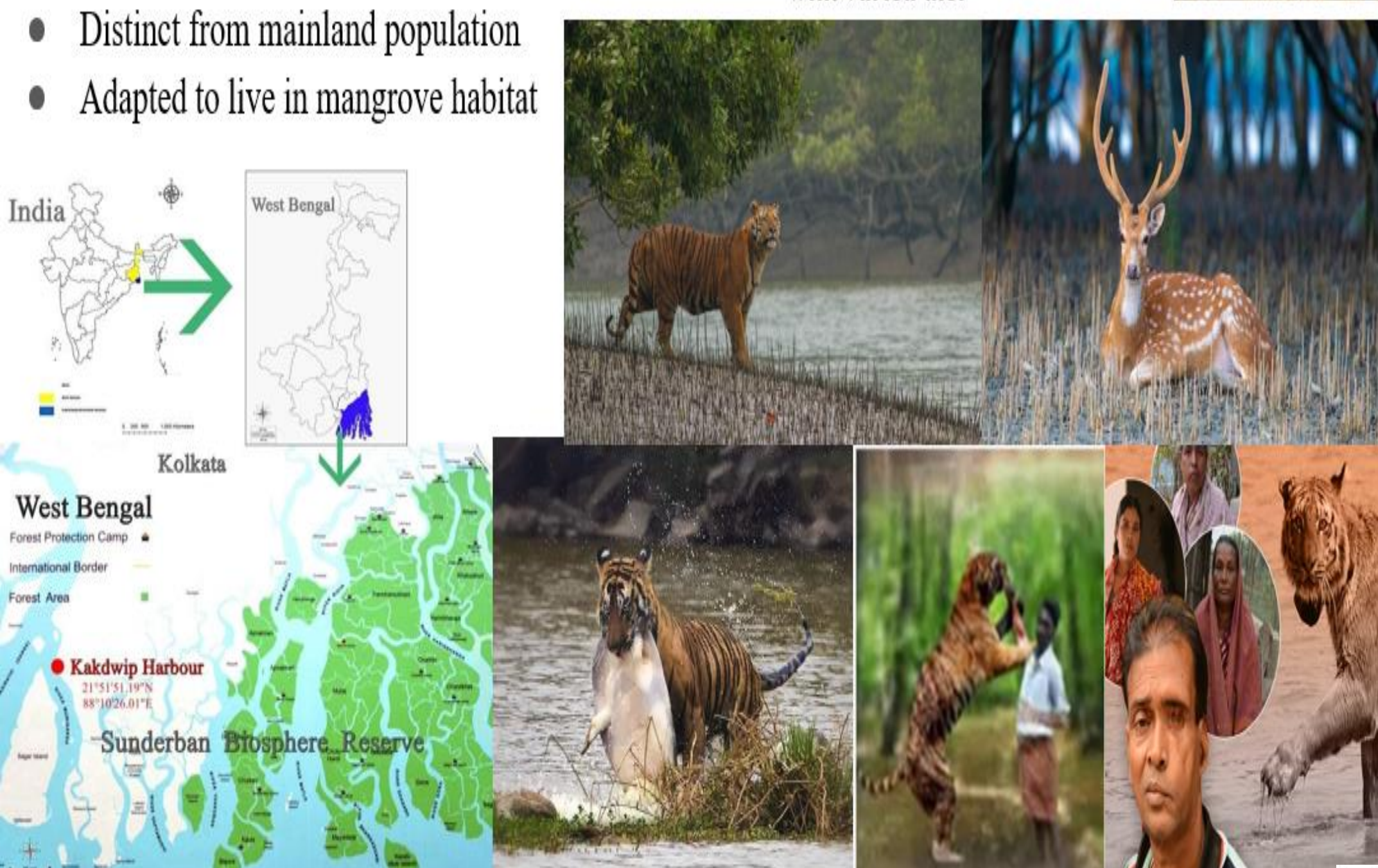
The Sundarbans



Sundarban Tiger: Mangrove/Swamp Tiger

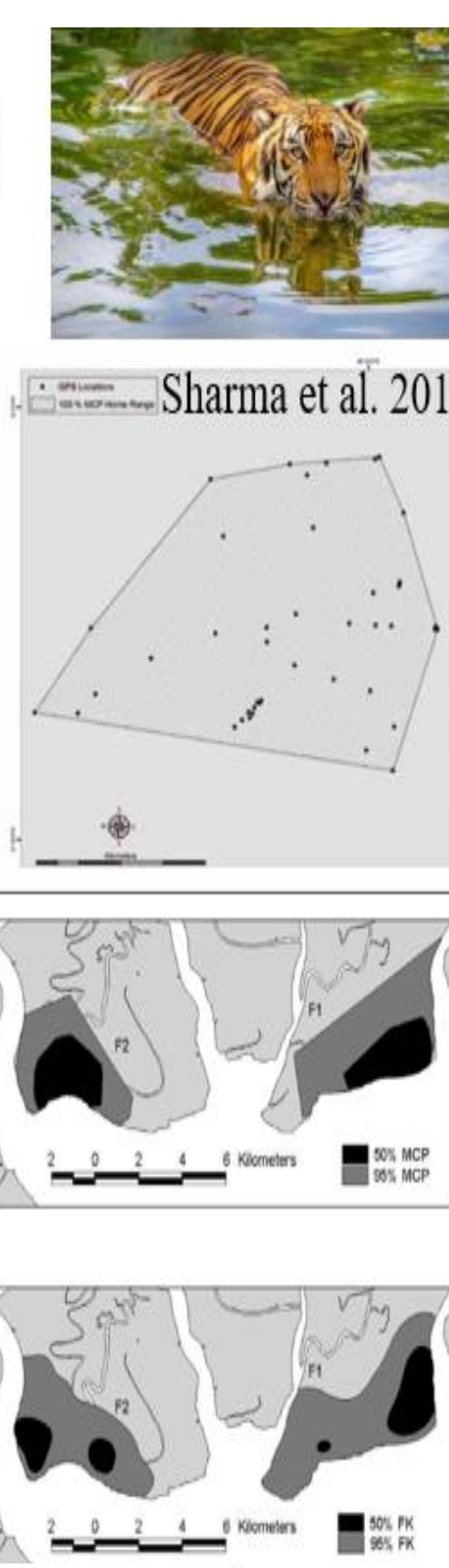
- Only population inhabiting mangrove forests
- Distinct from mainland population
- Adapted to live in mangrove habitat

Long distance swimmer with varied diet



Sundarban Bengal Tiger habitat needs

- Adapted to live in mangrove forest.
 - Require both land and water.
- Solitary - only congregate where large food sources are available.
- Female, male, or female with cubs occupy individual home ranges.
- Difficult to study!
- Male tigers have larger territories (20 square miles) that overlap with several females' home ranges (17 square miles)
- Require non-fragmented areas.



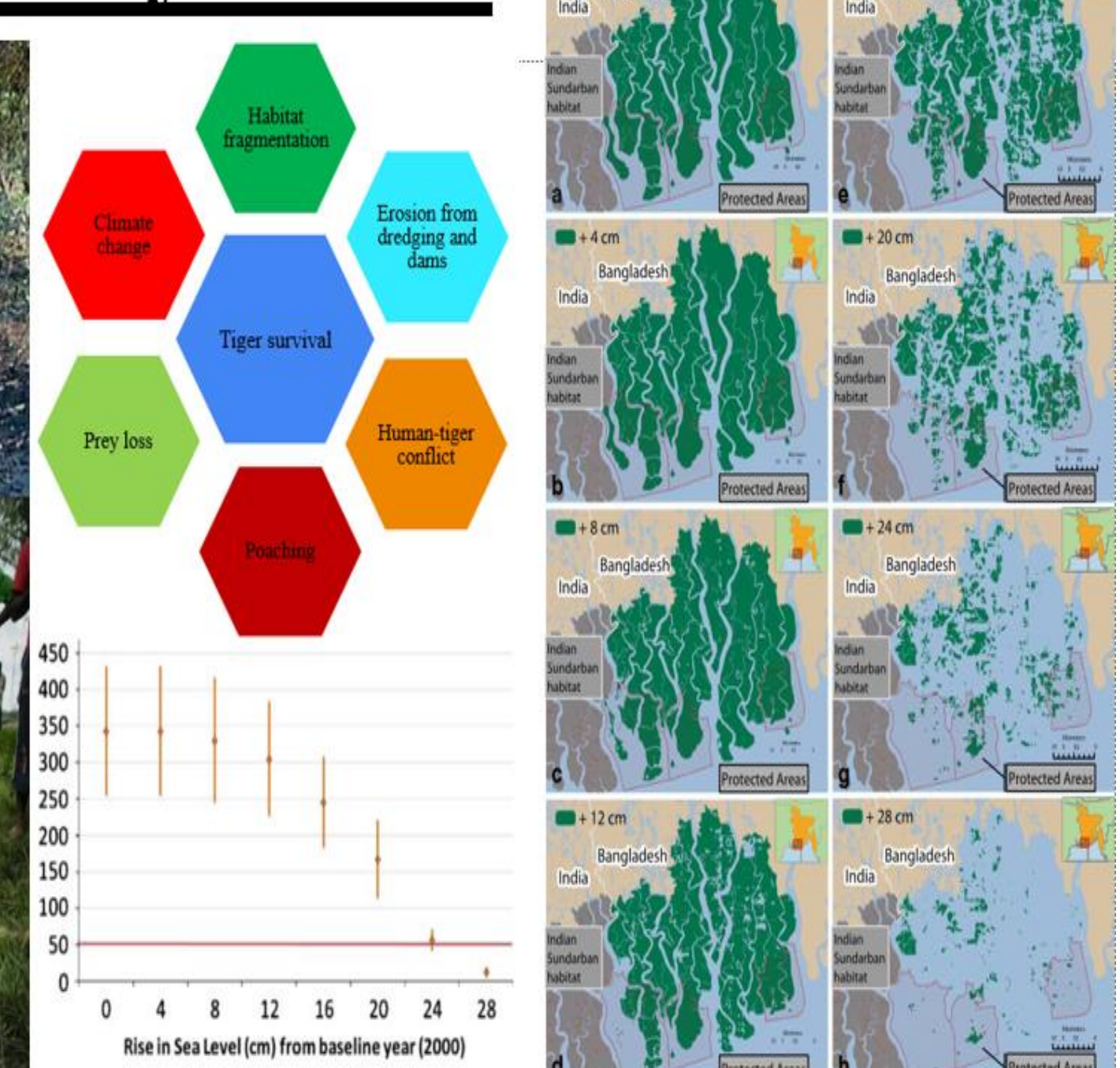
of the Tiger Conservation Landscapes are capable of supporting more than 250 tigers

- 54 islands in delta are home to 4.4 million people.
- Increasing population puts pressure on ecosystems and reduces tiger habitat.
- Increased salinity affects agriculture, drinking water, and human-tiger conflicts.
- Complex emotions for tigers: fear, conflict, reverence
- Humans depend on mangroves:
 - Provisioning: water, fish, shrimp, crab, honey, wood
 - Meendharas: women collecting tiger prawn eggs —high risk, labor-intensive, pays \$1/day
 - Affected by cyclones
 - Overfishing, erosion, habitat loss
 - Tourism: wildlife and ecotourism
- Deterioration of mangrove ecosystems lead to migration.
- Decline in ecosystem services.

Human connections



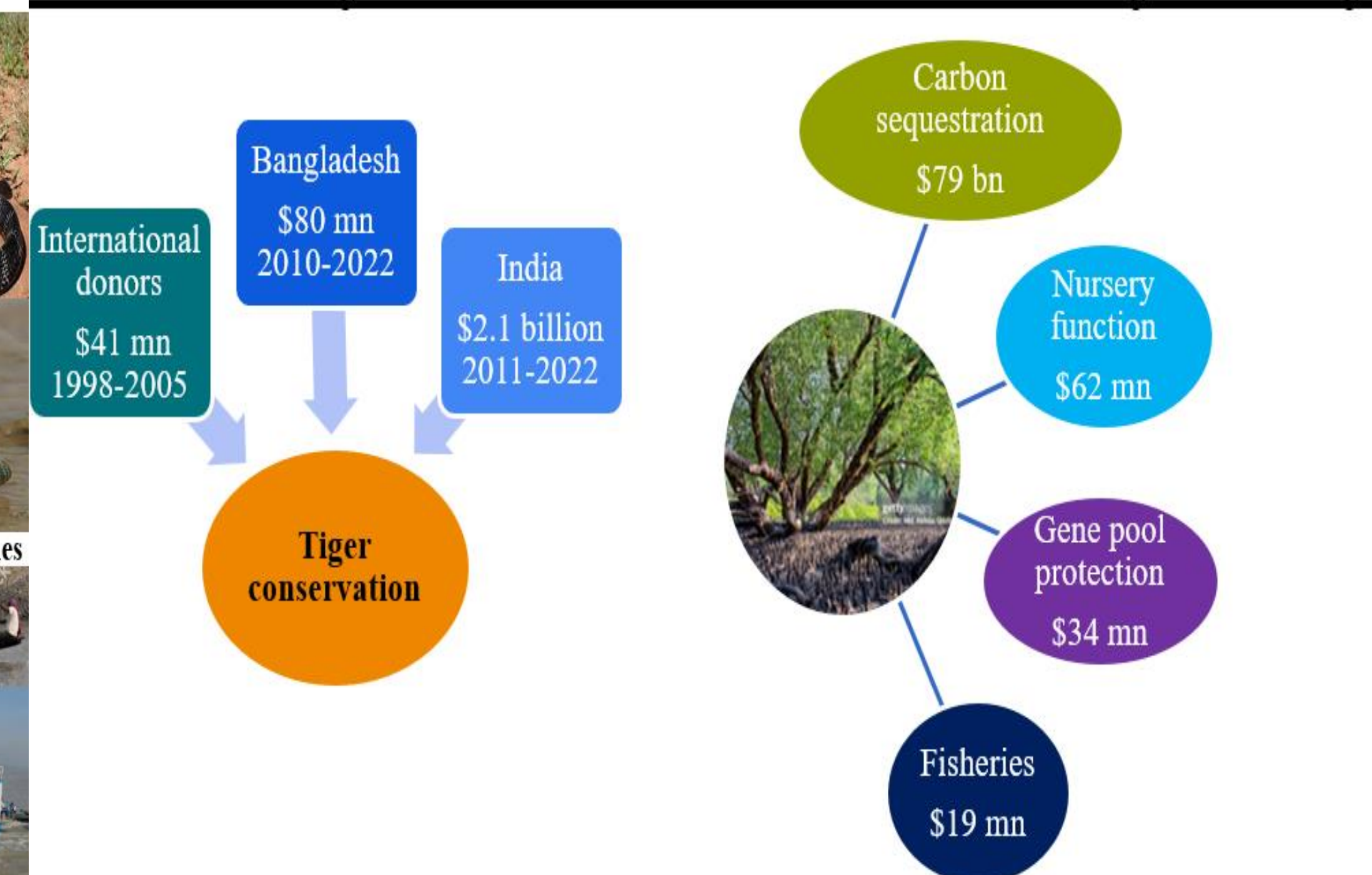
Tiger faces many threats



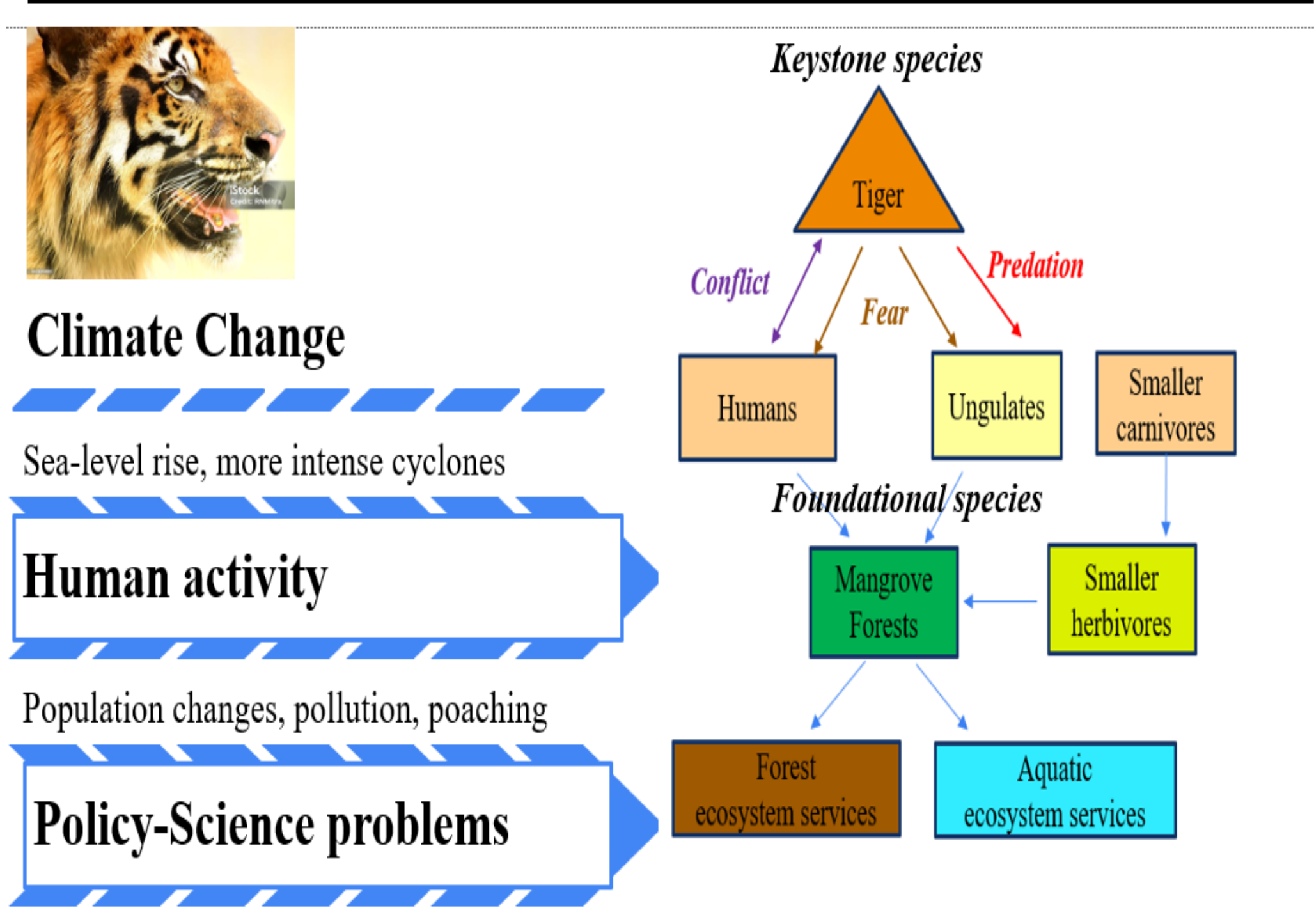
Biodiversity, ecosystem services, important industries



These ecosystem services are valued by society



Conceptual Model: Conserve Tiger to protect Ecosystem Services



Take aways

- Sundarban tiger is regionally as well as globally endangered.
- Sundarbans— unique landscape providing valuable ecosystem services.
- Many threats: climate change, habitat loss, human activities.
- **Problem:** Conserve ecosystem services accounting for threats.
 - Tradeoffs between ecosystem services and tourism
 - Poverty and environmental justice
 - Improper law enforcement
 - Human-tiger conflict
- Solutions?
 - Impacts of climate change are detrimental to both tigers and people.
 - Tiger as keystone species could conserve mangroves to protect ecosystem services.
 - Develop empirical approach to operationalize conceptual model.