Rhisotope Project: Environment

The Rhisotope Project in South Africa uses radioactive isotopes to mark rhino horns, making them detectable at borders and unusable in the black market, thereby deterring poaching. It combines nuclear science, wildlife conservation, and global anti-trafficking cooperation.

Rhisotope Project

Objective

Use radioactive isotopes to make rhino horns traceable and unattractive to poachers.

1. Launch: Initiated by the University of the Witwatersrand in South Africa.
2. Support: Backed by the International Atomic Energy Agency (IAEA).
3. Location: Implemented in the Waterberg Biosphere Reserve, South Africa.
4. Pilot Phase: 5 rhinos injected with low-dose radioactive isotopes for testing.

Radioactive Isotopes, Unstable forms of elements that emit radiation, detectable by specialized monitoring systems.

Injection Method

Low-dose isotope is injected into the horn using a non-invasive procedure. Safe for both rhinos and humans (no harmful radiation exposure).

Detection

Horns can be detected by Radiation Portal Monitors (RPMs) at airports, ports, and border crossings. RPMs are already used globally to track illicit nuclear materials.

Testing

Detection trials conducted using 3D-printed keratin horns placed inside full shipping containers. Customs agents successfully detected tagged horns.

Benefits Over Traditional Anti-Poaching Methods

Less Disruptive

Unlike dehorning, horns remain intact, preserving the animal's natural behavior and ecology.

Preventive Measure

Makes horns “poisonous” and useless to humans, reducing black-market demand.

Traceability

Enables law enforcement to track illegal movement and origin.

Global Monitoring Integration

Can be detected through existing radiation monitoring infrastructure.

Global Species Diversity

5. Rhino Species Worldwide

1. African: White Rhino, Black Rhino
2. Asian: Indian (Greater One-Horned), Javan, Sumatran

Rhinos in India

Main Species, Greater One-Horned Rhino (*Rhinoceros unicornis*)
Population (2024), ~3,700 (International Rhino Foundation)

Distribution

1. Kaziranga National Park
2. Pobitora Wildlife Sanctuary

3. Orang National Park, Jaldapara WLS, Dudhwa NP

Protection Status

1. Wildlife Protection Act, 1972: Schedule I
2. IUCN Red List: Vulnerable

Key Conservation Efforts in India

1. Project Rhino – State-led protection and anti-poaching measures.
2. Indian Rhino Vision 2020 – Aimed to increase rhino population and expand habitats.
3. National Rhino Conservation Strategy (2019) – Comprehensive protection plan.
4. DNA Profiling of Rhinos – Strengthens wildlife crime detection.
5. New Delhi Declaration on Asian Rhinos – Regional conservation pact with Bhutan, Nepal, Indonesia, Malaysia.

African vs Asian Rhino – Key Differences

Feature	African Rhino	Asian Rhino
Horns	Two horns	One horn (Indian, Javan); two horns (Sumatran)
Skin	Less armoured	Thick, folded armour-like skin
Nature	More aggressive	Less aggressive
Swimming Ability	Poor swimmers	Good swimmers
Diet	Grazers (low vegetation)	Browsers (tall grasses, shrubs)

Conservation Status

1. African Rhinos

1. White Rhino – Near Threatened
2. Black Rhino – Critically Endangered

2. Asian Rhinos

1. Indian Rhino – Vulnerable
2. Javan Rhino – Critically Endangered
3. Sumatran Rhino – Critically Endangered

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