

























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Summary:

- **Invasive Species:** The Andaman and Nicobar Islands face ecological challenges from invasive alien species (IAS), with the chital deer on Ross Island being a prime example.
- **Chital Impact:** Introduced in the early 20th century, chital deer have become invasive due to overgrazing and competition with native species, threatening the islands' biodiversity.
- **Management Strategies:** Solutions include stricter biosecurity measures, public awareness, eradication or control programs, and continuous research and monitoring.
- **Legal Framework:** India's Wildlife Protection Act (amended in 2022) and the Convention on Biological Diversity provide guidelines for managing IAS, focusing on prevention and control.

What is the news?

- The pristine beauty of the Andaman and Nicobar Islands, a crown jewel of India's biodiversity, faces a growing threat – invasive alien species (IAS). These non-native plants and animals, introduced inadvertently or intentionally, pose a significant ecological threat to the islands' delicate ecosystems.
- In a bid to manage the teeming population of chital (spotted deer) in Ross Island (officially known as the Netaji Subhash Chandra Bose Island), the Andaman and Nicobar Islands administration recently sought help from the Wildlife Institute of India.
- This editorial delves into the dangers of IAS, focusing on the case of chital deer, and explores solutions to protect these precious islands.

Understanding the Threat:

IAS thrive in new environments due to a lack of natural predators or competitors. Their rapid reproduction and adaptability disrupt the delicate balance of native ecosystems. They compete with native species for resources like food and space, leading to:

- **Habitat Degradation:** IAS can alter vegetation patterns, disrupting the food web and crucial habitats for native species.
- **Loss of Biodiversity:** Competition from aggressive IAS can lead to the decline or extinction of vulnerable native plants and animals, diminishing the islands' unique biodiversity.
- **Economic Impact:** Invasive species can damage agricultural crops and forests, impacting local livelihoods and tourism.

The Case of the Chital:

The chital, a spotted deer native to mainland India, is a prime example of an invasive threat. Introduced to the Andamans in the early 20th century, chital have flourished in the absence of predators. Their herbivorous nature has led to concerns about:

- **Forest Damage:** Chital overgraze native vegetation, hindering forest regeneration and impacting other herbivores.
- **Disruption of Food Webs:** Their increased population disrupts the natural food chain, impacting predators like reptiles and birds.
- **Threat to Endemic Species:** Competition for resources could endanger the Andamans' unique flora and fauna, including rare orchids and birds.

From Ornamental Addition to Ecological Threat:

- Originally hailing from mainland India, the chital arrived on Ross Island in the early 20th century, likely intended for recreational purposes. However, with no natural predators to keep their numbers in check, the chital population boomed. This rapid rise has raised concerns about their impact on the island's unique biodiversity.

Understanding Invasive Alien Species (IAS):

- The Convention on Biological Diversity (CBD) defines IAS as species introduced beyond their natural range that pose a threat to native flora and fauna. These “invaders” can be animals, plants, or even microbes, and their impact on ecosystems can be far-reaching. They may arrive through natural processes or, more commonly, human intervention. Their ability to adapt, reproduce rapidly, and outcompete native species for resources allows them to establish themselves in new environments.

India's Take on Invasive Alien Species (IAS):

- While the CBD offers a broad definition of IAS, India's Wildlife Protection Act (amended in 2022) takes a narrower approach. It focuses on non-native species whose introduction or spread could threaten wildlife or its habitat. This is important because some native species, like the chital in the Andamans, can pose invasive threats in specific regions.
- The Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) estimates that over 37,000 alien species are established worldwide, with new arrivals happening at an alarming rate of 200 per year.

What are the examples of invasive alien species in India?

India faces a significant threat from various invasive alien species (IAS) across different categories. Here are some prominent examples:

Plants:

- **Lantana camara (Lantana):** This fast-growing shrub forms dense thickets, outcompeting native vegetation and disrupting ecosystems.
- **Prosopis juliflora (Vilayati Keekar):** This invasive tree thrives in arid and semi-arid regions, displacing native plants and impacting water availability.
- **Parthenium hysterophorus (Parthenium weed):** This fast-spreading weed aggressively colonizes disturbed areas, causing allergies and reducing biodiversity.

- **Chromolaena odorata (Siam weed):** This aggressive weed forms dense monocultures, suppressing native plant growth and altering fire regimes.
- **Eichhornia crassipes (Water hyacinth):** This rapidly reproducing aquatic plant clogs waterways, hindering navigation and affecting water quality.

Animals:

- **Chital (Axis deer):** Introduced to some islands like Ross Island in the Andamans, their herbivorous nature disrupts the island's delicate ecosystem. (While native to mainland India, they are considered invasive in these specific island locations)
- **African catfish (Clarias gariepinus):** This predatory fish disrupts native fish populations and can alter food webs in freshwater bodies.
- **Nile tilapia (Oreochromis niloticus):** Introduced for aquaculture, this fish outcompetes native fish for resources and can alter water quality.
- **Red-eared slider turtle (Trachemys scripta elegans):** Popular as a pet, this turtle has been released into water bodies, where it competes with native turtles for food and habitat.
- **African house gecko (Hemidactylus frenatus):** This small, invasive gecko competes with native geckos for food and resources and can transmit diseases.

These are just a few examples, and the list of invasive alien species in India is constantly evolving.

The Devastating Impact of Invasive Alien Species (IAS):

- Invasive species disrupt the intricate balance of ecosystems by altering food chains and outcompeting native species for resources. This can lead to cascading effects, as seen in Rajasthan's Keoladeo Park, where an introduced African catfish preys on waterfowl, jeopardizing the UNESCO World Heritage site. Beyond ecological damage, the economic costs of IAS are staggering, exceeding \$423 billion globally in 2019. In India, the cotton mealybug, introduced from North America, has devastated cotton crops in the Deccan region, causing significant economic losses.

Combating the Invasive Threat:

Protecting the Andamans requires a multi-pronged approach:

- **Prevention:** Stricter biosecurity measures are crucial to prevent the introduction of new IAS. Public awareness campaigns can educate locals and tourists about the dangers of releasing unwanted pets or plants.
- **Eradication or Control:** Eradicating established IAS populations can be challenging. Controlled culling programs, in conjunction with habitat restoration efforts, may be necessary.
- **Research and Monitoring:** Continuous monitoring and

research are essential to understand the spread and impact of existing IAS populations. Developing species-specific control methods is crucial.

What is the Chital, and why is it considered an invasive species on Ross Island?

The Chital, also known as the spotted deer or axis deer, is a beautiful creature native to mainland India. However, on Ross Island in the Andamans, they are considered an invasive species. Here's why:

Native Origins, Problematic Introduction:

- The Chital were introduced to Ross Island in the early 20th century, most likely for recreational purposes.

- Lacking natural predators on the island, the Chital population flourished due to:
 - Abundant food resources
 - Absence of competition

Ecological Threat:

- Their herbivorous nature poses a threat to the island's native vegetation as they:

- Overgraze on plants and seedlings
 - Disrupt natural regeneration patterns
- This disrupts the island's delicate food chain and ecosystem balance, potentially impacting:
- Other herbivores dependent on the same plants
 - Predators who rely on specific prey populations

Competition with Endemic Species:

- The Chital compete with native species for resources like food and space.
- This competition could endanger the survival of unique flora and fauna found only in the Andamans, including rare orchids and birds.

Management Challenges:

- Finding the right balance between controlling the Chital population and protecting these animals is complex.
- Eradication can be ethically controversial and challenging.

Long-term solutions require exploring options like:

- Habitat management
- Chital population control through sustainable methods
- Introduction of predators (if feasible), but only after careful consideration

- The chital situation on Ross Island highlights the challenges of managing invasive species. Finding a solution requires scientific research, collaboration, and a commitment to protecting the island's unique ecosystem.

In essence, the Chital, despite being native to India, are considered invasive on Ross Island because their introduction disrupts the island's ecological balance and threatens the survival of other native species.

Conclusion:

- The fight against IAS requires proactive measures. By implementing stricter regulations, raising awareness, and investing in research, we can protect the Andamans' ecological richness. These islands, with their unparalleled biodiversity, are a national treasure. We must act now to ensure they remain a haven for native species and a symbol of India's pristine natural beauty.

What does Wildlife Protection Act, 1972 (amended in 2022) say about invasive alien species?

The Wildlife Protection Act, 1972 (amended in 2022) takes a specific approach to invasive alien species (IAS) within India. Here's a breakdown of what the Act says:

Focus on Non-Native Threats:

- Unlike the broader definition used by the Convention on Biological Diversity (CBD), the Wildlife Protection Act defines IAS with a narrower focus. It targets animal or plant species not native to India whose introduction or spread could threaten wildlife or its habitat.

Crucial Distinction:

- This definition is crucial because it excludes species native to India that might exhibit invasive behavior in specific regions. For example, the chital deer, though protected in mainland India, are considered invasive on Ross Island in the Andamans due to their disruptive impact on the island's ecosystem.

Regulation and Prohibition:

The 2022 amendment empowers the Central Government to regulate or even prohibit the import, trade, possession, or proliferation of IAS that pose a threat to wildlife or habitats in India. This allows authorities to implement measures like:

- **Import/Export Restrictions:** Regulating the import and export of potentially invasive species.
- **Trade Bans:** Prohibiting the trade of specific IAS within India.
- **Possession Limitations:** Restricting the ownership or possession of certain invasive species.

Focus on Effective Implementation:

The Act provides the framework, but its effectiveness hinges on proper implementation. This includes:

- **Identifying Invasive Species:** Creating and maintaining a list of IAS posing a threat to Indian wildlife.
- **Enforcement Measures:** Developing strong enforcement mechanisms to ensure compliance with regulations.
- **Public Awareness:** Educating the public about the dangers of IAS and promoting responsible behavior towards native ecosystems.

Limitations of the Act:

- While the Act is a positive step, it has limitations. It doesn't address the issue of IAS already established within India, like the chital on Ross Island. Additionally, effective implementation requires adequate resources and collaboration between various government agencies.

The Wildlife Protection Act's provisions on invasive alien species represent a step towards protecting India's biodiversity. However, a comprehensive approach combining the Act's regulations with scientific research, public awareness, and effective enforcement is crucial to address the growing threat of IAS.

What does Convention on Biological

Diversity (CBD) says about invasive alien species ?

The Convention on Biological Diversity (CBD), also known informally as the Biodiversity Convention, is an international treaty signed during the 1992 Rio Earth Summit. It's a key agreement for the conservation of global biodiversity and the sustainable use of its components.

The Convention on Biological Diversity (CBD) takes a broader approach to invasive alien species (IAS) compared to India's Wildlife Protection Act. Here's what the CBD says:

Definition of invasive alien species (IAS):

- The CBD defines IAS as “species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce.” This definition emphasizes the introduction and ability to establish a self-sustaining population outside the species' natural range.

Focus on Threats:

The key aspect of the CBD definition is the potential threat posed by these introduced species. The CBD highlights IAS that can:

- Threaten ecosystems, habitats, or species This includes disrupting food chains, competing for resources, and introducing diseases.
- Cause significant environmental and socioeconomic impacts This encompasses biodiversity loss, economic damage to agriculture and forestry, and

even public health risks.

Global Perspective:

The CBD recognizes IAS as a major threat to global biodiversity. It encourages member nations to:

- Develop national strategies and action plans to address the introduction and spread of invasive alien species (IAS).
- Prevent the introduction of new invasive alien species (IAS) by implementing strict biosecurity measures like quarantine controls.
- Control or eradicate existing invasive alien species (IAS) populations through various methods depending on the specific species and situation.
- Monitor and assess the impacts of invasive alien species (IAS) to understand their spread and develop targeted management strategies.
- Promote international cooperation to share information and expertise on tackling invasive alien species (IAS) issues.

CBD vs. Wildlife Protection Act:

- The key difference between the CBD and India's Wildlife Protection Act lies in the scope of the definition. The CBD offers a broader definition encompassing all introduced species with the potential to cause harm, while the Wildlife Protection Act focuses specifically on non-native species that threaten wildlife or habitat.

The CBD plays a crucial role in raising global awareness about the dangers of invasive alien species and promoting international cooperation to address this critical environmental challenge. While India's Wildlife Protection Act adopts a narrower definition, it aligns with the CBD's overall goals by regulating the introduction and spread of potentially harmful non-native species.

What are the Initiatives Related to the Management of Invasive Alien Species?

There are several initiatives underway to manage invasive alien species (IAS) on a global and national level. Here's a breakdown of some key efforts:

International Initiatives:

- **Convention on Biological Diversity (CBD):** As discussed earlier, the CBD plays a crucial role by providing a framework for international cooperation on IAS management. It encourages member countries to develop national strategies, share information, and implement control measures.
- **International Plant Protection Convention (IPPC):** This international treaty focuses on preventing the spread of plant pests, including invasive alien plant species. It establishes guidelines for phytosanitary measures like quarantine controls for plant and plant products moving across

borders.

- **Global Invasive Species Network (GISN):** This network serves as a platform for communication and collaboration among scientists, policymakers, and conservationists working on IAS issues. It facilitates knowledge sharing, promotes best practices, and raises public awareness.
- **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES):** This independent body provides scientific assessments on biodiversity and ecosystem services, including the impacts of IAS. Their reports inform policymakers and guide international strategies for IAS management.

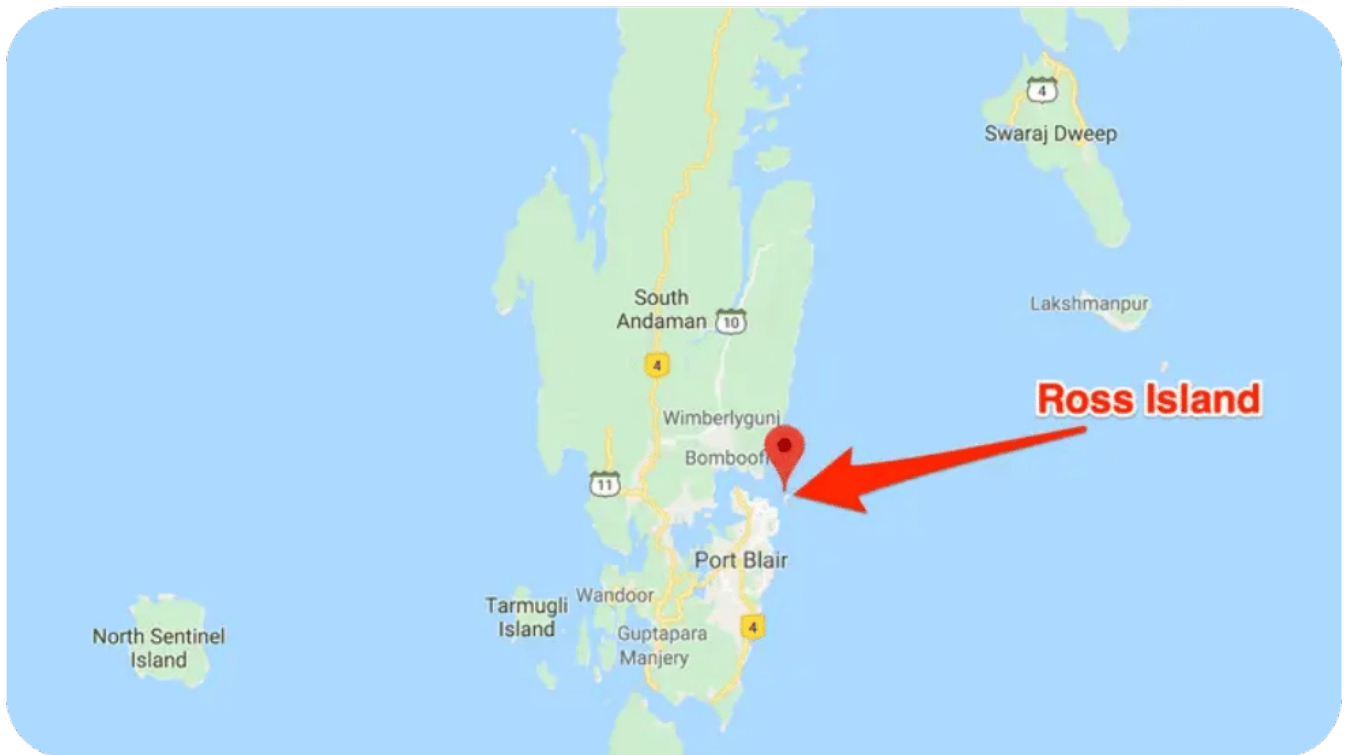
National Initiatives (India):

- **Wildlife Protection Act, 1972 (amended in 2022):** This Act regulates the introduction, trade, and possession of IAS that pose a threat to wildlife or habitats in India.
- **National Biodiversity Action Plan (NBAP):** This plan outlines strategies for biodiversity conservation in India. It includes actions for managing IAS, such as early detection, rapid response, and control or eradication programs.
- **Ministry of Environment, Forest and Climate Change (MoEFCC):** This ministry spearheads India's efforts on biodiversity conservation and IAS management. They develop policies, fund projects, and collaborate with research institutions and NGOs.
- **State Forest Departments:** These departments play a crucial role in implementing IAS management programs at the ground level. They conduct

surveys, monitor populations, and carry out control measures.

About Ross Island:

- Ross Island, officially known as Netaji Subhash Chandra Bose Island, is an island in the Andaman Islands that's part of the South Andaman administrative district. It's located 3 kilometers east of Port Blair and is less than a square kilometer in size.
- Ross Island is steeped in history, natural beauty, and colonial settlement. It was the capital of the British from 1858 to 1941, when the Japanese occupied it and converted it into a Prisoner of War (POW) site. The Japanese built war installations and the island is now deserted. The few signs of its colonial glory, such as the Chief Commissioner's house and the Presbyterian church, are dilapidated and overgrown. The area is now under the control of the Indian Navy.



(Pic:google img)

Ross Island: A Gem Facing an Invasive Challenge

A Serene Island steeped in History:

- Ross Island, a captivating jewel nestled amongst the Andaman and Nicobar Islands, boasts a rich history and mesmerizing beauty. Once known as “Paris of the East” during the British Raj, the island served as the administrative headquarters of the region. Ruins of colonial architecture, remnants of grand buildings, and a serene atmosphere make Ross Island a popular tourist destination.

A Delicate Ecosystem:

- Beyond its historical significance, Ross Island is

recognized for its diverse ecosystem. Lush green vegetation, pristine beaches, and a vibrant wildlife population contribute to the island's charm. However, this delicate balance faces a growing threat – invasive alien species (IAS).

The Chital Challenge:

- The chital, or spotted deer, native to mainland India, were introduced to Ross Island in the early 20th century. With no natural predators, their population has boomed. While these graceful creatures may seem like a picturesque addition, their presence disrupts the island's ecological equilibrium.

Ecological Concerns:

- The chital's herbivorous nature leads to overgrazing, hindering the regeneration of native plants. This disrupts the food chain and poses a threat to other herbivores and predators who rely on these plants and specific prey populations. Additionally, the chital compete with endemic island species for resources, potentially jeopardizing their survival.



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Category: General Studies

Public awareness campaigns aimed at reducing the threat of invasive alien species (IAS) can focus on:

- Encouraging responsible pet ownership, particularly for exotic species.
- Educating people about the importance of using native plant species in landscaping.
- Highlighting the economic losses caused by IAS to agricultural crops.
- All of the above.

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Category: General Studies

Consider the following control methods for invasive alien species (IAS):

- (1) Introduction of natural predators.
- (2) Chemical herbicides and pesticides.
- (3) Mechanical removal of individual organisms.
- (4) Habitat modification to make it less suitable for the IAS.

Which of the above methods can be MOST beneficial for controlling invasive alien species populations?

- Only 1
- Only 2
- Only 3
- A combination of all the above methods may be necessary depending on the specific IAS.

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Category: **General Studies**

Consider the following statements about Invasive Alien Species (IAS) in India:

- (1) The Wildlife Protection Act, 1972 (amended in 2022) defines IAS as any species introduced outside its natural range that can threaten native wildlife.
- (2) The Convention on Biological Diversity (CBD) has a narrower definition of IAS compared to India's Wildlife Protection Act.
- (3) The Chital deer is considered an invasive species in all parts of India.

Which of the statements given above is/are correct?

- Only 1
- Only 2
- Only 1 and 3
- Only 1 and 2

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Category: **General Studies**

A key challenge in managing invasive alien plant species in India is:

- Overexploitation of native plant resources for commercial purposes.
- Lack of effective quarantine procedures at international borders.
- Limited knowledge about the life cycle and ecological impact of native plants.
- Unsustainable harvesting practices in natural forests.

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Category: General Studies

Which of the following is NOT a potential consequence of invasive alien species (IAS) on an ecosystem?

- Disruption of food chains and competition for resources with native species.
- Introduction of new diseases and pathogens that can harm native flora and fauna.
- Increased biodiversity and habitat heterogeneity within the ecosystem.
- Alteration of fire regimes and increased risk of wildfires.

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Mains Questions:

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Question 1:

Invasive Alien Species (IAS) pose a significant threat to India's biodiversity. Discuss the challenges associated with managing IAS populations in India and suggest a multi-pronged approach for effective control. (250 words)

Model Answer:

Challenges in Managing IAS in India:

- **Limited Resources:** Implementing control programs, conducting research, and enforcing regulations require significant financial and human resources, which are often limited.
- **Lack of Awareness:** Public awareness about the dangers of IAS and responsible behavior towards native ecosystems is often lacking, hindering efforts to prevent introductions and enlist community support.
- **Difficulties in Eradication:** Eradicating established IAS populations can be challenging due to their rapid reproduction rates, adaptability, and the vastness of affected areas. Ethical considerations regarding control methods add to the complexity.
- **Climate Change:** Climate change can exacerbate the spread and impact of IAS by altering ecosystems and making native species more vulnerable to competition and predation.

Multi-Pronged Approach for Effective Control:

- **Prevention:** Stricter biosecurity measures at borders, quarantine procedures, and regulations on the import and trade of potentially invasive species are crucial. Public awareness campaigns can educate communities about responsible pet ownership and plant management.
- **Early Detection and Rapid Response:** Developing robust monitoring systems for early detection of new IAS incursions allows for swift action before populations become established.

- **Control and Eradication:** A combination of methods may be necessary, including mechanical control (removal), biological control (introducing natural predators), and chemical control (herbicides/pesticides) as a last resort, with careful consideration of environmental impacts.
- **Research and Development:** Investing in research to understand the biology, ecological impact, and effective control methods for specific IAS is essential for developing targeted strategies.
- **International Cooperation:** Collaboration with neighboring countries and international organizations allows for knowledge sharing, best practices exchange, and coordinated efforts to prevent the spread of IAS across borders.
- **Community Involvement:** Engaging local communities in monitoring, control efforts, and awareness campaigns can foster a sense of ownership and promote long-term sustainability.

Question 2:

The Chital deer, while native to mainland India, is considered an invasive species on Ross Island in the Andamans. Discuss the ecological concerns associated with the Chital's presence on the island and suggest possible solutions for managing the population. (250 words)

Model Answer:

Ecological Concerns of Chital on Ross Island:

- **Overgrazing:** The Chital's herbivorous nature leads to overgrazing of native vegetation, hindering plant regeneration and disrupting the food chain.
- **Competition:** They compete with native herbivores for food and space, potentially jeopardizing the survival of endemic island species.
- **Disrupted Ecosystem Balance:** The Chital's presence disrupts the island's delicate ecological balance, impacting other fauna that rely on specific prey populations or plant resources.

Possible Solutions for Managing Chital Population:

- **Habitat Management:** Manipulating the island's habitat through controlled burns or planting less desirable vegetation could influence chital behavior and resource utilization.
- **Sustainable Population Control:** Exploring humane and sustainable methods like fertility control or culling a limited number of individuals might be necessary. (Ethical considerations must be addressed)
- **Reintroduction of Predators (if feasible):** Reintroducing natural predators of the Chital, after careful evaluation of potential consequences for the island's ecosystem, could be an option for long-term control.
- **Scientific Research:** In-depth research is crucial to understand the Chital's impact on the island and develop the most effective management strategy with minimal ecological disruption.

Remember: These are just sample answers. It's important to further research and refine your responses based on your own understanding and perspective. Read entire UPSC Current Affairs.

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- **GS Paper I: General Science: Ecology and Biodiversity**

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- **Paper III – Environment, Ecology, Biodiversity, and Climate Change:**
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Issues of over-exploitation, climate change, and environmental pollution

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Quiz Time

The profit triples with a doubling of the selling price. Determine the profit percentage.

Option 1

Option 2

Option 3



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