



Water mist sprays on Muslim pilgrims as they prepare near Mecca during the 2023 Hajj pilgrimage.

health-monitoring bracelets could also be critical lifesaving investments.

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10.1126/science.adr2696

India's Nicobar plan threatens biodiversity

India's Andaman and Nicobar Islands territory, which comprises 836 mostly uninhabited islands between the Bay of Bengal and the Andaman Sea, is a global biodiversity hotspot. Forest covers about 82% of the islands' total geographic area (1). In March 2022, India sanctioned a development plan for the southern tip of the Great Nicobar Islands, which, if implemented, would cause habitat loss and fragmentation, possibly leading to species extinctions and behavioral changes, as well as the spread of invasive species (2). India must safeguard the islands' biodiversity and culture from exploitation by infrastructure development.

India's plans include building an international transshipment terminal, airport, township, and power plant (2). The project would require about 166 km² of mostly forest-covered land, an area that makes up about 10% of the Great Nicobar Islands' total land (2).

The Great Nicobar Islands harbor a network of protected areas, including Galathea National Park, which is only 0.3 km away from the proposed project site. This pristine tropical evergreen forest and mangrove coast is home to scleractinian corals (3) and the endemic and Critically Endangered Nicobar treeshrew (4). Of the



LETTERS

Edited by Jennifer Sills

Hajj pilgrims suffer from climate extremes

Each year, more than 2 million Muslims converge in Mecca, Saudi Arabia, to perform the Hajj, a religious duty in Islam. The pilgrims, many of whom are elderly and physically vulnerable, face multiple days of intense activities and prolonged exposure to Mecca's harsh climate (1). In 2024, more than 1300 pilgrims died of heatstroke (2). The Hajj will occur in hot seasons for the next several years. Because of the event's religious significance, cancellation, postponement, and relocation are not possible. Therefore, adequate risk mitigation measures must be planned and implemented to prevent mass casualties.

The Eastern Mediterranean and Middle East are climate change hotspots, with projected temperature increases of about 0.45°C per decade (3). During the 2024 Hajj in June, high temperatures in Mecca reached 49°C, with temperatures at the Grand Mosque at times reaching 51.8°C (2, 4). Saudi Arabia is also increasingly grappling with other climate extremes, including heavy rainfall and floods (5), which could pose new risks for Hajj pilgrims, who sometimes stay in temporary tents (6).

Interventions have decreased risks to pilgrims in the past. Over the past three decades, at least 5000 pilgrims have perished in crowd crush incidents (7), but advances in crowd management—including the expansion of the Jamarat Bridge (8),

efforts to prevent opposing crowd flows, and smarter scheduling systems (9)—have reduced such incidents. The spread of infectious diseases has also been reduced by interventions. After the 2000–2001 outbreak of meningococcal meningitis, the Hajj Monitoring Authority implemented mandatory vaccination, masks, health counseling, and real-time surveillance (10). COVID-19 protocols, such as vaccination, social distancing, and capacity limits, successfully minimized the pandemic's impact (11).

Saudi Arabia has already made enormous investments to protect pilgrims from the heat, such as installing misting shower stations along pilgrimage routes and providing air-conditioned tents in Mina (12). However, those amenities were only available to those who secured permits in advance (2). Stricter regulation of pilgrim entries, including tighter controls over unregistered participants, could ensure equal access to protective amenities. Given that the Hajj operates under strict quota systems based on country populations, the partnership between Saudi Arabia and these nations must be strengthened, with travel agencies held to higher standards of accountability to ensure that Saudi Arabia is prepared to safeguard all pilgrims from extreme conditions.

Saudi Arabia should also educate pilgrims, many of whom do not take sufficient precautions, about heat-related illnesses and prevention measures. Such campaigns should target pilgrims traveling from cooler climates, who are substantially more susceptible to the heat (1). Preidentification of high-risk individuals and real-time health monitoring through devices such as

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islands' 274 bird species, 39% are endemic (5, 6). The islands are home to 9% of the endemic avifauna in South Asia, despite representing only 0.2% of the land (5, 6). The region also contains 14% of South Asia's endemic flora (7), including orchids (8) and palm species (9).

The proposed development is a direct threat to these endemic and rare species. The environmental assessment report for the project identifies 13 Schedule I species in the area, including active nests of endemic species such as the Nicobar megapod, which construction could permanently destroy (2). India's decision to proceed with the project despite the known environmental risks violates the United Nations Sustainable Development Goals, is inconsistent with the Decade on Ecosystem Restoration goals, and undermines the Convention on Biological Diversity's biodiversity targets for 2030 (10–12). Massive infrastructure projects in global biodiversity hotspots exacerbate the dual threat of habitat loss and climate change. India should reverse its decision to pursue development in these global biodiversity hotspots.

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10.1126/science.adr2665

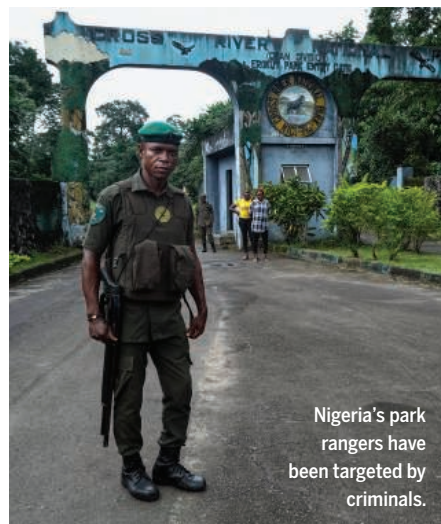
Criminal activity in Nigeria's protected areas

Nigeria's protected areas cover more than 127,000 km² and account for about 14% of the total national landmass (1). These

protected areas, and the park rangers who staff them, are vital to protecting Nigeria's rich biodiversity and endangered and endemic species. However, criminal groups of outlaws and militias, known locally as bandits, have taken refuge in protected areas and are conducting training and terrorist activities (2, 3), targeting personnel of Nigeria's Department of Wildlife Protection and the rural communities in and around parks (1, 4). Under different flags and leaders (such as Bello Turji and Dogo Gidé), these criminal enterprises have intensified their activities in and around Nigeria's protected lands (1, 3, 5–8) and continue to expand into previously unoccupied locations (1, 2, 7–10). Nigeria must ensure security for its park rangers and local communities to prevent debilitating declines in biodiversity conservation.

Criminal groups have kidnapped locals and park rangers for ransom and destroyed park assets (1, 7, 8), leading to the suspension of daily operations—including patrols, wildlife surveys, and tourist activities—in three out of the seven national parks that have been established on the country's protected land (2, 10). Between 2019 and 2021, members of these groups killed nine wildlife rangers (1, 7, 9). In the past 5 years, increases in criminal activities have substantially hindered conservation efforts (1, 2, 8, 10), and illegal mining and hunting have degraded habitats (4, 7–9).

The Nigerian government and its global partners must work to eliminate these criminal groups. Nigeria should increase fiscal appropriations to its Park Service, which presently receives less than 0.5% of the national budget (9). With additional funds, the Park Service could invest in technology for surveillance, intelligence gathering, and collaboration with other security organizations. Real-time monitoring systems, such



Nigeria's park rangers have been targeted by criminals.

as EarthRanger in Kenya and Zambia, and the e-Eye surveillance system in India's tiger reserves, have enhanced the safety of park rangers and reduced poaching incidents. These technologies provide real-time data on ranger movements, improving security in remote and vulnerable areas (11, 12).

In addition to wildlife monitoring and guiding tourists, Nigeria's park rangers enforce park laws, apprehend trespassers, and handle violent offenders who participate in illegal hunting, logging, and unauthorized entry into protected areas. These law enforcement duties can place rangers in direct confrontation with dangerous individuals. Given the added risks posed by bandits, park rangers could benefit from access to modern firearms and combat training to enhance their preparedness and safety. Only when park rangers and local communities are safe from violence can Nigeria effectively protect its lands and biodiversity.

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