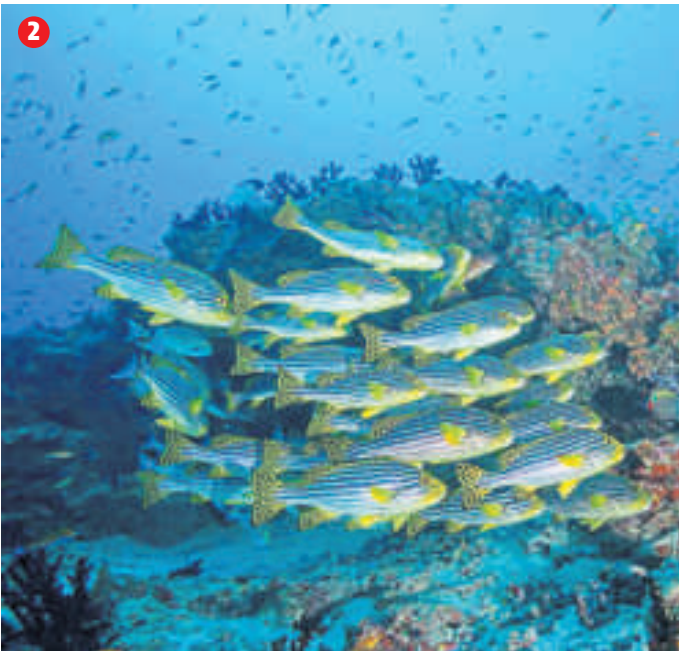


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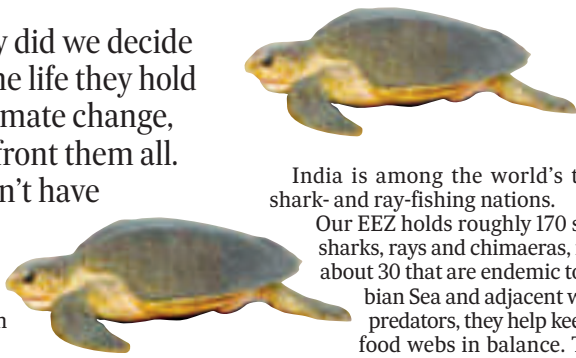


The oceans around India were once the epicentre of the maritime world. Why did we decide to turn our backs on them? What is that likely to cost us? These waters and the life they hold are crucial to our economy and our well-being. Now, they face a polycrisis. Climate change, biodiversity loss, rising sea levels, food insecurity... the oceans force us to confront them all. Yet, we have had conservation successes on land, and there's no reason we can't have them at sea too. Rohini Nilekani writes of great risk, and great opportunity

Rohini Nilekani
letters@hindustantimes.com

It was a weak monsoon this year. The fishermen have offered coconuts to the sea in gratitude nonetheless. On Narali Poornima, the fishing communities of Maharashtra set out in their boats for a new season. This is a socio-religious tradition and an ecological one. Similar customs prevail across faiths. Christian fishermen in Goa, for instance, resume fishing after the feast of Saint Lawrence, celebrated annually on August 10. For several weeks before these dates, fisherfolk everywhere abstain from plying their boats, not just because of the turbulent seas amid the monsoon, but because these are the months when marine life is breeding. Such customs were practised all along our coastlines long before modern bans were enacted. They came from an understanding that humans are intertwined with nature's rhythms. For more than 2,000 years, with its coastal and oceanic habitats spanning the Arabian Sea, Bay of Bengal, Andaman Sea and Indian Ocean, India has been at the centre of the maritime world. Lothal in Gujarat has one of the world's earliest known dockyards, dating to the Harappan Civilisation (c. 2400 BCE), providing physical evidence of maritime trade between the Indus Valley and Mesopotamia. There was trade in sea turtles with the Roman Empire too, going back more than 2,000 years. The Chola dynasty famously had a maritime legacy that flourished between the 9th and 13th centuries CE. Originating in Tamil Nadu, these rulers strategically pivoted from an agrarian culture to a maritime power, expanding their hegemony across South India, Sri Lanka and South-East Asia.

They saw the seas as channels through which to exert influence and power. Long before European colonial forces came to militarise the routes, maritime trade flourished between the peoples of regions such as Gujarat, Malabar and Bengal, and those of West Asia and beyond. Historically, Indian civilisations understood the ocean as central to identity and political strategy. One could argue that India now suffers from a deep amnesia about its seafaring past. A mental model sets us up as a land-based civilisation. We are more likely to celebrate the Guptas and Mauryas than the Cholas, who represent our own blue-water imperial ambitions. Despite having a coastline of about 11,000 km (a revision from the older figure using higher spatial data, including islands), the modern State has treated our waters as an afterthought, especially when it comes to livelihoods, conservation and sustainability. Even though about 16 million people depend directly on marine fisheries for their primary livelihood, fisheries until recently came under the Ministry of Agriculture, and marine conservation remains but a footnote in a conservation agenda designed around tigers and forests. India's Exclusive Economic Zone (EEZ), which gives the country rights extending up to 200 nautical miles from the coasts, covers about 2 million sq km. India accounts for about 6.4% of global marine biodiversity across its coral reefs, mangroves, seagrass meadows, estuaries and mudflats. More than 20,000 animal species and 1,100 plant species have been recorded across the country's marine ecosystems. We have five of the world's seven sea turtle species in our waters. They are a keystone species, controlling jellyfish populations, maintaining coral-reef health, and transporting nutrients between marine and terrestrial ecosystems.



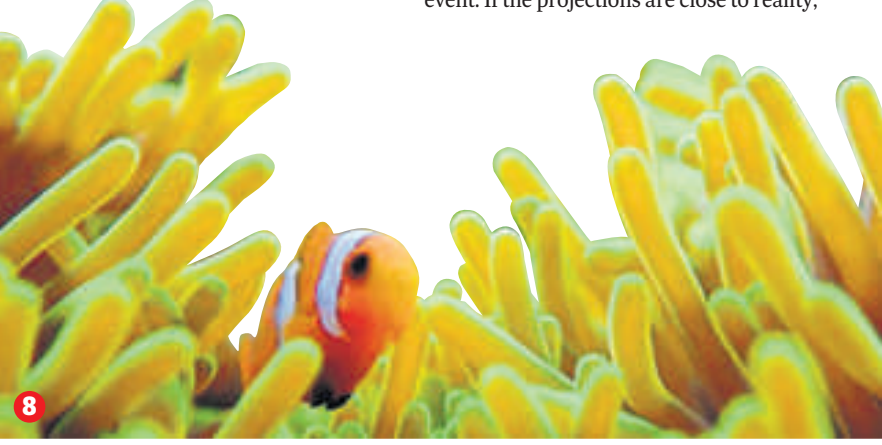
India is among the world's top three shark- and ray-fishing nations. Our EEZ holds roughly 170 species of sharks, rays and chimaeras, including about 30 that are endemic to the Arabian Sea and adjacent waters. As predators, they help keep marine food webs in balance. They also support the livelihoods and food security of numerous communities. Nevertheless, sharks and rays are among the most threatened groups in Indian waters, and catches have declined steadily across decades. Meanwhile, despite these treasures, only about 5% of the country's coastal and marine areas are designated as protected according to the Sixth National Report under the Convention on Biological Diversity. India is rushing to meet its commitment to get 30% of its waters declared as protected areas under the Kunming-Montreal Global Biodiversity Framework, but so far we are nowhere close.

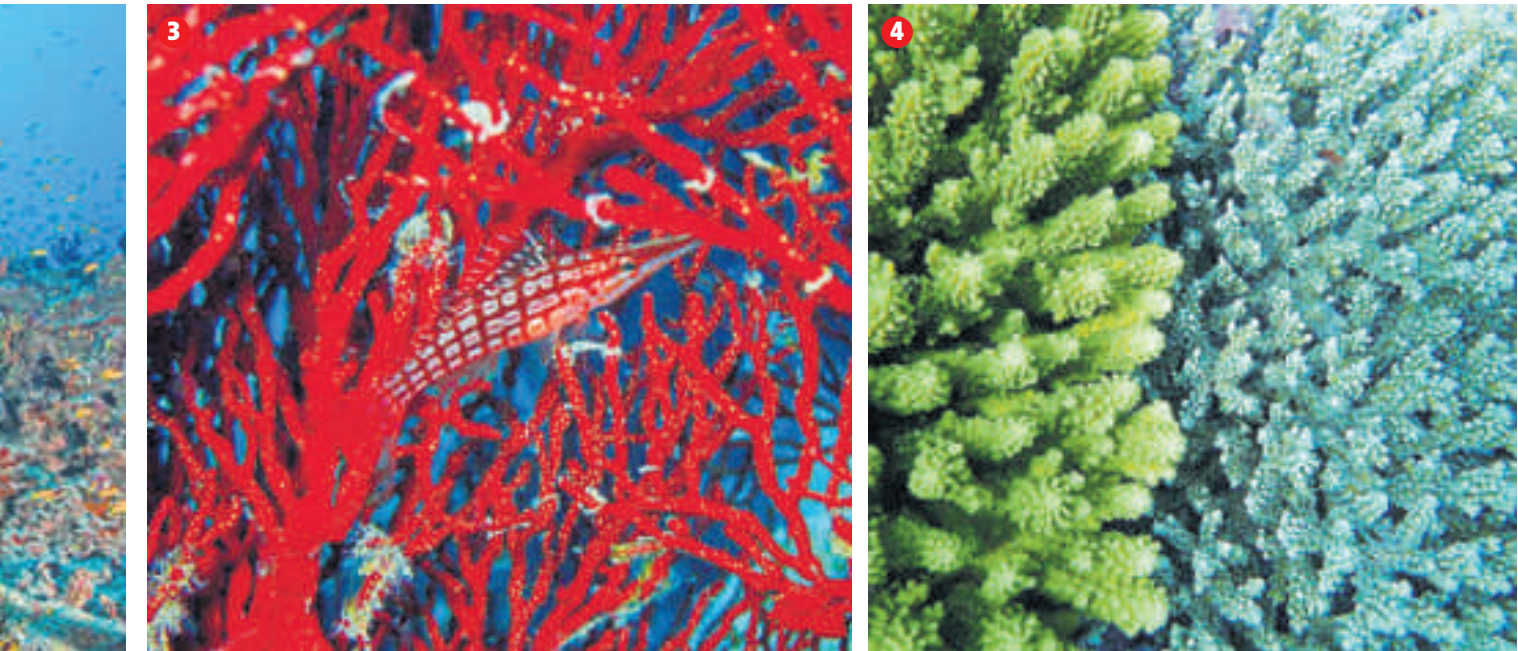
On the research front, marine science remains neglected and siloed across different institutions and we have barely any long-term monitoring of ocean life. This is concerning, given that commercial fishing now operates at a very different scale from the artisanal fishing it competes with, and needs a more rigorous application of fish biology and scientific evidence. Recent research suggests that even the annual fishing ban overlaps with the breeding periods of only 40% of commercially fished species, leaving the other 60% unprotected. The current government is more ambitious when it comes to our oceans. We already have the Sagar Mala, which is

the port-led development project, and the Maritime India Vision 2030, which aims to place the country among the world's top five shipbuilding nations. The government has now articulated a new maritime doctrine for the Indian Ocean: Mahasagar, short for Mutual and Holistic Advancement for Security and Growth across Regions. Its stated aim is to link economic development with regional security and environmental stewardship. The government is ably supported by the country's premier ocean science institute, the National Institute of Oceanography (NIO), headquartered in Goa. Established in 1966 under the Council of Scientific and Industrial Research (CSIR), it documents marine biodiversity and pollution and conducts multidisciplinary research, including deep-sea mineral research, notably polymetallic nodule exploration, a long-running programme to extract value from the ocean floor. Part of the State's new ambition is a Rs 81,000-crore project to develop Great Nicobar Island (GNI). The plan includes a mega port, new city, international airport, military base, and industrial park. This is explicitly framed as a way to strengthen India's strategic position in the region. This project is a centrepiece in the country's shift from a defensive to a power-projecting maritime posture, harking back perhaps to the Chola empire. The government has spoken of the development projects in both the Andaman and Nicobar Islands as a blue economy hub. This idea covers fisheries and aquaculture, and coastal and marine tourism. It acknowledges the unique marine biodiversity there yet desires deep-sea mineral exploration and oil and gas extraction in the

North Andaman Basin. There are in-built contradictions here that will require meaningful trade-offs between development and the environment. It may also need a fresh economic assessment of potential stranded assets in a seismically and climatically vulnerable region. These are among the more contested infrastructure projects in India today. GNI has one of the last remaining pristine rainforests in the country, and hosts the Shompen, one of the last tribes living in voluntary isolation. Both indigenous communities and environmentalists oppose the project for its estimated ecological and human costs. Mainland Indians, partly because of our lack of knowledge about our strategic maritime assets and about the way of life of off-shore islanders, may not understand what the fuss is all about. We may well believe that the trade-offs are worth the strategic advantage to be had. Does India not need strategic self-reliance in turbulent global waters? If some low-lying islands may be submerged in a few decades from global warming and sea rise anyway, is it not a good idea to exploit their potential now? These questions may be valid, yet the developing context broadens the issues way beyond the GNI project. India's coast faces a polycrisis. We cannot speak separately about climate change, biodiversity loss, rising sea levels and food insecurity. The oceans force us to bring it all together. The tropical Indian Ocean has warmed faster than other oceans and marine heat-wave days are expected to rise tenfold by 2050. We already know that this year's El Nino might be a once-in-a-thousand-year event. If the projections are close to reality,

READ: The birds and the beeps: Clicks, chirps and calls are boosting conservation efforts. By Rohini Nilekani





1. A fisherman casts his net at South Bay in Little Andaman Island.
2. A shoal of Oriental sweetlips group at a reef in the Andaman Islands.
3. A longnose hawkfish lies camouflaged in a gorgonian sea fan.
4. Two competing species of Acropora corals, in the Indian Ocean.
5. A scene from 2025, a year that saw over 500,000 olive ridley turtles nest at the Rushikulya rookery in Odisha.
6. A reef squid glints in the waters of the Indian Ocean.
7. Fishermen haul a net to shore in Malvan, Maharashtra.
8. An Ocellaris clownfish in its sea anemone. There is vibrant life in our seas, delicate ecosystems – and time, still, to attempt to strike a balance.

PHOTOS: ADHITH SWAMINATHAN, UMEED MISTRY, ROHAN ARTHUR, BIPRO BEHERA, NAYANTARA SIRIGURI & EVAN NAZARETH

IF BUSINESS CONTINUES AS USUAL, LAKSHADWEEP MAY BE AMONG THE FIRST INTERNALLY DISPLACED TERRITORIES OF INDIA BEFORE THE END OF THE CENTURY. AND IT MAY BE OUR CANARY IN THE COAL MINE

this Super El Nino will destroy many coral reefs and coastal fisheries.

In the low-lying atolls of Lakshadweep, coral reef cover has already fallen by about half. Many “sensitive taxa” are already gone and only slow-growing and structurally simple corals remain. After this El Nino, marine ecosystems may take far longer to recover, as the ability to self-repair and grow is further compromised.

The provisioning services and protection that marine ecosystems give and that we take for granted are weakening before our eyes. If business continues as usual, Lakshadweep may be among the first internally displaced territories of India before the end of the century.

And while it might be difficult for people far away on the mainland, with worries of their own, to care about a small island and its few-thousand residents, Lakshadweep might be our canary in the coal mine.

Many of India’s most densely populated cities, including Mumbai, Chennai, Kolkata, Surat, Visakhapatnam and Kochi, are clustered in low-lying areas around the coast, increasingly vulnerable to rising sea levels, cyclone intensification, coastal ingress and salinity.

Our coastline is more densely populated and more vulnerable than it has ever been.

Meanwhile, fish remains one of the cheapest sources of animal protein available for millions. Fish protein is a critical part of India’s nutritional security. Yet we have a crisis of overfishing even before the problems from warming seas hit us.

Our fish catch has plateaued at about 3.5 million tonnes, despite serious efforts to raise it. Fishermen send out more boats and spend longer hours at sea, and still return with less. Catch from trawlers is periodically of such low quality, it is only fit for animal feed and fertiliser.

A primary challenge, when it comes to improving fisheries management, is the lack of robust, long-term, accessible data, exacerbated by limited monitoring capacity and the scattered nature of fisheries.

There are very few civil-society organisations focused on marine research and protection, on coastal livelihoods, and on policy intervention. Among them are Nature Conservation Foundation and Dakshin, both of whom my philanthropy supports. Coming from diverse perspectives, they have worked for decades to support sustainable livelihoods and community-based adaptive resilience, engaged in maritime research, and helped conserve species and ecosystems. They need much more philanthropic support as they continue their work in this critical field.

They write of the lived experiences of fisherfolk, which stand testimony to deep imbalances and vanishing species.

They warn us that aquaculture, promoted as a solution to the overfishing crisis, still needs wild-caught stock to feed farm operations. These organisations and others like them ask pertinent questions about how we can prioritise development but better accommodate societal well-being and generational futures.

There are difficult trade-offs ahead, with no easy answers.

Yet people do want better solutions. What is a compromise between doomsday prophecies and irrational optimism?

Many government institutions, policy-makers and conservation organisations are looking for fixes that can disrupt and be replicated at scale.

A prevalent techno-optimism is predicated on the idea that we can use technology to fix the mistakes we have made.

A blue-carbon economy is emerging and the government’s narrative around it is spreading fast. Funds have been poured into marine restoration targeted at replanting mangroves, restoring coral reefs and sea-grass meadows, and repairing coastal dunes. Marine scientists worry that these well-intentioned, expensive efforts might be palliative at best.

Maybe we need to imagine a future that does not try to restore a fictionalised perfect past.

I have gone on amateur snorkelling excursions in the Indian Ocean since the 1980s, specifically in Goa and the Andaman Islands. On recent such trips, it has felt as though the life and colour were drained out of a vibrant painting.

I don’t know if the coral-reef diversity of my past can be revived in my lifetime. Can it be revived in my grandson’s lifetime? That seems like a question worth asking.

Can we harvest now, urgently, the traditional knowledge held by elders?

Can we learn from communities that have thrived alongside the oceans for thousands of years?

We acknowledge, in spheres such as technology, that adaptive design can be learned from past endeavours.

We know that a resilient future lies in strong local institutions. There are examples from around the world of governments and local communities working together for sustainable management.

Can we better use the lessons we have already learnt, as well as cutting-edge technology, large datasets, satellite-based observation and even AI, to protect the structural complexity that keeps these massive ecosystems alive and productive?

Equally important: Can we inspire the next generation to engage with our maritime past and future?

We must retain hope and faith in the resilience of nature, and of our oceans.

As a nation we have been singularly successful in land-based conservation. Our tigers, rhinoceroses and numerous other species have rebounded in number. As a people, if we can look towards our shores instead of turning our backs on them, we could create similar success stories and protect our marine treasures.

In Odisha, on the upcoming Kartik Purnima in November, the tradition of Boita Bandana will be observed.

The day is still considered auspicious as it commemorates ancient Odia maritime trade voyages. Families of merchant sailors would perform rituals for a safe journey. Even today, boats are worshipped and offerings made to the sea, and sometimes to Varuna, god of the oceans.

India’s oceans and coastal areas are critical to our economy, but also to our well-being.

Perhaps we need new rituals that will reconnect us with a powerful ancient imagination. With tales of a Samudra Manthan that can be a source of both poison and panacea, and was churned to produce amrut, the nectar of immortality, which today we can translate as sustainability.

Amid the strongest El Nino in maybe 1,000 years, we must hold on to every bit of hope. Or find it in us to become the Kurma avatar, the strong foundation on which an emerging future can rest.

(Rohini Nilekani is chairperson of Rohini Nilekani Philanthropies and author of *Samaaj, Sarkaar, Bazaar: A Citizen-Based Approach*)

culture

A Japanese guide to keeping it together



A depiction of the Great Ryogoku Fire of Tokyo, 1881, in a work by Kobayashi Kiyochika. The city now has fire-breaks or non-combustible spaces such as roads, rivers and rail corridors woven into its grid system.

Gowri S

gowri.s@hindustantimes.com

There’s a lot more to Japan’s famous sakura tradition than gathering to admire cherry blossoms. This delicate annual rite is in fact a form of disaster-preparedness.

Every winter, moisture in the soil near riverbanks would freeze and expand. In centuries gone by, the spring thaw would loosen the mud, and rain could trigger landslides. So, way back in the 8th century, Nara rulers began to encourage spring picnics in April, a practice that then spread from the nobility to the general populace over time.

The weight of hundreds of people walking about and sitting on blankets helped compact the soil, “creating a man-made solidity,” says Miho Mazereeuw, an associate professor of architecture at the Massachusetts Institute of Technology (MIT), where she also set up and heads the Urban Risk Lab.

This unique culture is full of such workarounds, some of which Mazereeuw details in her book, *Design Before Disaster*.

Simple examples include architecture that ensures schools can double as evacuation sites during earthquakes and floods. This means sturdier-than-normal construction, as well as more toilets, and reservoirs in the form of rooftop swimming pools “that also keep the school buildings cool in summer,” Mazereeuw says. Stairs are situated on the outsides of these buildings, so they can serve as an instant escape route during floods.

Japan, of course, has a long history of negotiating earthquakes and volcanoes, situated as it is above four tectonic plates.

It has responded, Mazereeuw notes, by creating a collective culture of preparedness that the world at large could now benefit from. Hearing stories from her Japanese parents of how this culture saves lives, and is woven into daily life, inspired her interest in this field.

What are some of the most intriguing Japanese design-for-disaster lessons? Take a look.



{ DEE FOR DRAMA }

Deepanjana Pal



Case closed?

Drishyam 3 is an easy watch. We know the hero is in no real danger. The sense of menace is largely missing, though. For that, we have to go all the way back to Part I

Perhaps the boldest move in Drishyam: The Conclusion comes from director and co-producer Abhishek Pathak, who says he plans to end this immensely successful film series.

Audiences love Vijay Salgaonkar (Ajay Devgn). Applause kept erupting, in the theatre where I recently watched him outwit the police yet again, in the third film.

Still, quite a lot has changed.

Vijay has had something of a glow-up since we first met him in 2015. By part two, released four years ago, the cable operator had become the owner of a successful movie theatre. Now, along with the dead body, all his wrinkles have disappeared, leaving his face as smooth as an uncooked chapati.

Still, he is a working-class hero. An underdog who survives by his wits and doggedly continues to take on the establishment. This makes him refreshingly different from Bollywood heroes of recent years.

Vijay Salgaonkar, played by Ajay Devgn, has had something of a glow-up since we first met him in 2015.



Waju circles

In the Nobi Plain where three rivers intersect, severe flooding is common. So, centuries ago, local communities devised a system of massive waju or circular embankments that protected homes, farms and granaries, while allowing the waters to flow around them. Through a complex network of sluice gates, they also managed to direct water through these flat, low-flying but rich and fertile lands, to irrigate fields.

Homes within were built on stone platforms about 1.5 ft high. Storehouses for grain were built much higher, 8 metres or more above the ground, and served as emergency evacuation spaces too. One of the largest, Takasu Waju, built in 1653, still encircles homes, granaries and rice fields, all technically at sea level, across a sprawl of 4,260 hectares.

Fire-resistant towns

Since 1981, Tokyo has had a series of bosai or disaster-ready residential zones, focused on fire safety. Here, firebreaks or non-combustible spaces such as roads, rivers and rail corridors are woven into the city’s grid system, to separate neighbourhoods in ways that would keep a large fire from spreading.

A major firebreak belt appears every 2 km. The grid curves with natural breaks such as rivers. In addition, along narrower streets, where it would be easier for flying embers to spread, building codes specify that non-combustible material must make up at least 40% of all street-facing walls.

Evacuation gardens

In 1923, amid the Great Kanto earthquake and the massive fire that followed, an estimated one million Tokyo residents survived because they escaped to open tracts of land.

Public parks then provided camping space for thousands who had lost their homes.

This forever changed how Japan viewed its parks. They became a key feature in emergency-response plans.

In the post-earthquake reconstruction of Tokyo, statesman Shinpei Goto even introduced a plan for refuge parks that would be equipped to house thousands at a time. Tokyo is still building more. Today, such spaces are fitted with solar-powered charging stations for electric bicycles and phones, public benches that can turn into cooking stoves, and manholes that double as emergency toilets. Perhaps the best-known of these is the Tokyo Rinkai disaster prevention park, a 33-acre space where lampposts serve as LAN connections too.

Tokyo alone has 58 such park-refuges.

While Drishyam (2015; directed by Nishikant Kamat) and Drishyam 2 (2022; directed by Pathak) were faithful remakes of the Malayalam originals (released in 2013 and 2021), Pathak wrote the story of ...The Conclusion.

This time, Rajveer Singh Tomar (Jaideep Ahlawat) of the Crime Branch reopens the case in which Vijay is a suspect. Star prosecutor Indrajith Shetty (Prakash Raj) joins Tomar and former policewoman Meera (Tabu) in their hunt for the man.

None of this perturbs our hero, largely because Devgn’s one expression is deadpan. It doesn’t help that Tomar’s idea of intimidation involves palming Vijay’s right pectoral and murmuring “Dhak-dhak, dhak-dhak.”

Ahlawat is a wonderful actor and is occasionally menacing as Tomar, but Vijay never seems in any danger of being exposed. To Pathak’s credit, this works to his film’s advantage. The fun of Drishyam: The Conclusion is not in any pretension of suspense, but in the guarantee that the hero will make the brutish police look foolish.

A key revelation, however, does undercut the second film. Central to Drishyam 2 was an admission that Vijay’s wife Nandini (Shriya Saran) made to an undercover cop, which established that her husband had hidden Meera’s son’s corpse. In ...The Conclusion, we are told the family knew they were under surveillance. Why, then, would she share such confidences with a neighbour?

Then again, ...The Conclusion would have us believe a fake skeleton built by a props fabricator was so realistic that it fooled a gaggle of policemen. Evidently, making perfect sense is not among the film’s priorities.

The pulpy tone of Drishyam: The Conclusion is a far cry from how the series began. Kamat’s film was a remake more elegant than the original. Knowing the ending did nothing to dull its menace. The horror of sexual harassment came through viscerally (only to fade in the subsequent two parts). There was an immense satisfaction to watching a cruel police force reduced to helplessness by a community of everyday folk.

In this popular trilogy, Drishyam came first in more ways than one.

(Write to Deepanjana Pal @dpanjana on Instagram. The views expressed are personal)