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ARTICLE

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SEPARATED BY SPACE AND TIME, UNITED BY GRIEF - THE TRAGEDY OF BEING A LAKE

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We examine the disappearance of Tulare Lake (California) and the Aral Sea (Central Asia) - where river diversions for irrigation destroyed millennia-old lakeshore societies - as emblematic cases of global lake desiccation due to over-exploitation, silting, and waste dumping. We point out that lakes, ponds, and other waterbodies would play an increasingly important role in recharging underground aquifers and offering a relief on a planet under stress due to climate change.

Introduction

We know that water is the fundamental solvent and medium for Earth's intricate bio-geo-chemical cycles. It is indispensable for sustaining all known life forms and regulating the planetary climate system. Modern civilization is utterly dependent on freshwater resources for agricultural irrigation, industrial processes, energy production, and the maintenance of public health and sanitation.

However, we also know that accessible freshwater constitutes less than 1% of the planet's total water, rendering it a finite and vulnerable resource under immense pressure from population growth, pollution, and climate change-induced alterations to the hydrological cycle. Consequently, prudent and scientifically sound management is essential to avert catastrophic water scarcity, ecosystem collapse, transboundary conflicts, and severe disruptions to food security and socioeconomic stability, as its misuse can trigger cascading ecological and societal consequences. Lakes, ponds, and other water bodies, not only store the rainwater they also play a very important role in recharging groundwater/underground aquifers.

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Looking back at history and pre-history, we come across many civilisations which vanished without a trace. We know of them only from shreds of pottery, beads, ruins of masonry, some buried and forgotten treasures, and remains of burials, or perhaps from some fragments of legends mentioned in ancient literature, etc. And we can only speculate- what led to their demise.

In the annals of environmental history, few stories are as stark or sobering as the disappearance of Tulare Lake in California and the Aral Sea in Central Asia- separated by 8,500 km in space and about 100 years in time. Once vibrant ecosystems teeming with life, these bodies of water were reduced to near oblivion by human actions driven by shortsighted economic ambitions. Their fates serve as haunting reminders of the consequences of prioritising profit over planetary health. Greed and piecemeal shortsighted mismanagement drained these lakes, unraveling ecological and human communities. Their stories tell us the importance of sustainable coexistence with nature.

Tulare Lake: California's Lost Wonder- The Lake That Was

Tulare Lake, known as *Pa'ashi* ("Big Water") to the indigenous Tachi Yokut people (Yokuts for short), was once the largest freshwater lake west of the Mississippi. The southern San Joaquin Valley, where it is situated, receives very little annual rainfall—only about 10 cm a

Fig. 1: Lake Tulare with Atwell and Pelican Islands, if the lake filled to capacity again. (Created with 2019 USGS DEM data, Credit: Wikipedia)

Fig. 6: The shrinking of Aral Sea (Adapted from Ref. [2]).

Fig. 2: A portion of the revenant Tulare Lake (26 June 2023, Credit: Wikipedia)

Fig. 3: The Aral Sea (Credit: https://www.columbia.edu/~tmt2120/introduction.htm)

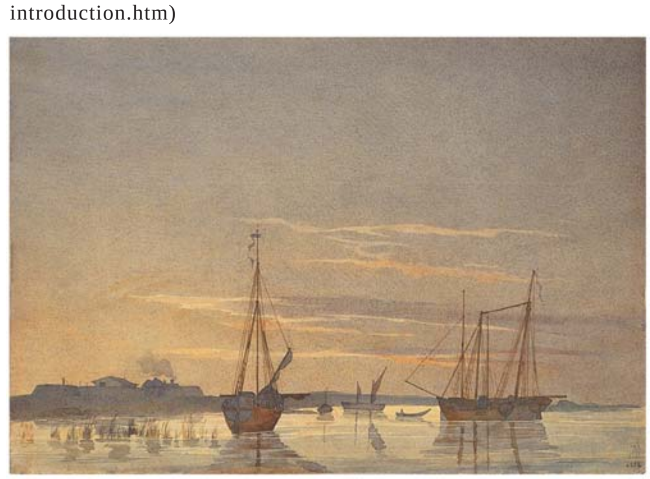

Fig. 4: First Russian boats on the Aral Sea, watercolor by Taras Shevchenko, 1848 (Credit: Wikipedia)

year—but rain was only ever a small part of its hydrology. Massive rivers like the Kern, the Kaweah, the Kings, and the San Joaquin once connected Sierra snowmelt to the flat valley below.

Tulare Lake was about 160 km long and 50 km wide and spanned over 2,600 sq km (Fig. 1). It was up to 12 m deep, though for several km near the shores it was only about 1 to 1.5 m deep. Yet, it was so vast that it facilitated steamship travel from Bakersfield to San Francisco. It supported a rich ecosystem of tule reeds, fish, and migratory birds.

The lake's air used to be filled with the calls of blackbirds, singing marsh wren, honking geese, chattering ducks, flocks of white pelicans, and black cormorants. And its waters teemed with thick-tail, hitch, blackfish, Sacramento perch, pikeminnow, and sucker. The larger fish, returning from their spawning migrations up the inflowing rivers, fed abundant plankton, shrimp, insect larvae, and juvenile fish. The marsh near the edges sheltered frogs, egrets and herons, as well as otters and beavers while the greenery around supported tule and tule elk. The high evaporation made water somewhat alkaline during drier periods, but the fresh water brought in must have kept it under check. This would have enhanced the lake's ability to support abundant life, especially fish production.

The Draining of the Tulare Lake

In the mid-19th century, European settlers first decimated the population of the Yokuts by bringing in smallpox, malaria, and other illnesses. Next, along with the other lakes in the valley, Tulare was drained by a series of water diversions, canals, and dams in the late 1800s and early 1900s. Tulare ran completely dry in 1898, for the first time in history.

The damming of the rivers feeding Tulare Lake—the Kern, Tule, Kaweah, and Kings—and diverting their water to irrigate crops like cotton, grapes, and almonds turned this place into an agricultural powerhouse. The European settlers also forced and finally banished the Yokuts away by occupying the land emerging from the draining of the lake. By the 1920s, the entire lake was reduced to a dusty basin and was repurposed for farming. The region now produces a wide variety of crops, including almonds, pistachios, grapes, citrus fruits, tomatoes, and lettuce, among others. The farmers also keep drawing excessively and unsustainably large amounts of groundwater to irrigate their crops.

However, in this process European settlers destroyed over 96 percent of the Valley's original four million wetland acres and destroyed over 90 percent of its riparian forests in less than 150 years. Of the 800,000 acres of saltbush, fewer than four percent remain[1]. The Lake, however, continues to exist everywhere: *in* place names like Old River Road, Panama, Venice, and Herring Road.

The Yokuts were displaced; their cultural heritage eroded alongside the ecosystem. The settlers cut down the native oaks that had provided acorns and burned acres upon acres of tule reeds to make way for agriculture, and their hogs, cattle, and other livestock trampled the tule roots and flattened the mussel beds that grew along the shore[1]. It led to a tragic loss of biodiversity.

The Ghosts of the Past

A popular Yokuts saying states that 'water has a memory.' And thus, Tulare Lake occasionally resurfaces when winter and spring storms, or heavy rains, or record snowpack, or any combination of them in California, sends water rushing through the Central Valley, where it settles on the low-lying impermeable clay bed of Lake Tulare. It happened several times, most recently in 2023, when record rains flooded the valley and caused a lot of damage to farmland as well as invited media attention. In 1906 floodwater stayed for five years. The lake flooded again in 1916, and yet again in 1921–1922 when the water stayed for another two years. In 1937–1938 too, the floods returned.

This re-emergence of the smothered Tulare Lake from time to time has given rise to names like ephemeral lake, phantom lake, ghost lake, zombie lake, revenant (returning, especially after death or a long absence) lake, magical lake, or 'the lake that would not die' (Fig. 2). With the return of the lake even the old weather patterns return, with cooler and more humid breezes[1]. When it happens, the fish and birds return till the drainage and the diversion of the water dries the lake up again.

As expected, the agricultural businesses try to swiftly pump the water out, prioritising crops over ecological revival.

While the re-emergence of the lake is resented by the farmers, the Yokuts welcome it, as it confirms their faith in the lake. In fact, reports talk of a Yokuts elder saying, "The lake is a reminder of what we've lost. But greed always drains it away." Today, the Tachi Yokut Tribe actively campaigns for wetland restoration, viewing Pa'ashi's return as cultural resurgence.

While Tulare Lake's fate offers a cautionary tale of local human impact, a similar, yet even more catastrophic, narrative unfolded thousands of km away in Central Asia, with the Aral Sea, which we discuss next.

The Aral Sea: An Oasis Turned Wasteland

The Aral Sea is an endorheic lake (sink or end lake, with no exit for the water), fed by the two major rivers: the Amu Darya (Oxus, from the south) and the Syr Darya (Jaxartes, from the northeast). It was the fourth-largest lake globally and spanned 68,000 sq km between Kazakhstan and Uzbekistan (Fig. 3). It used to have a length of about 435 km, width of about 290 km, and an average depth of 16 m, with a maximum depth of 69 m. In 1960, it had 1,060 cubic km of water. At its peak prior to significant human diversion (particularly before the 1960s, see later), the Amu Darya (40–45 cubic km/year) and Syr Darya (15–20 cubic km/year) rivers collectively delivered an average of approximately 55–60 cubic km of water annually into the Aral Sea.

The *Kyzyl-Kum* (red desert/sands, in the east and north-east) and *Kara-Kum* (black desert/sands, in the south) deserts border the Sea. The arid conditions and hot summers led to evaporation of similar amounts of water every-year, which helped maintain the level of the Sea.

By the 4th to 3rd millennia BCE Neolithic tribes had settled along the shores of the Aral Sea and in the Amu Darya delta, who engaged in fishing and hunting. Over time, these people developed agriculture and irrigation and by the 7th century BCE, the state of Khorezm (Khwarazm) was born. During the 1st century CE, the Aral Sea was known in the Roman Empire as the Oxian Lake (after the river Oxus). The Syr Darya had once been described by Alexander the Great as a fast-flowing obstacle to his army. By the 10th century, the Arabs, having conquered Central Asia, called it the Khorezm Sea. It was also referred to as the Gurganj Sea and Syr. The Turkic tribes referred to it as *Aral-Tengiz* or sea of islands. It is believed to have been the northernmost outpost of Khorezm and during the Middle Ages served as a caravanserai where traders stopped on the route, which was to be named as the Great Silk Road by German geographer and traveler Ferdinand von Richthofen in 1877.

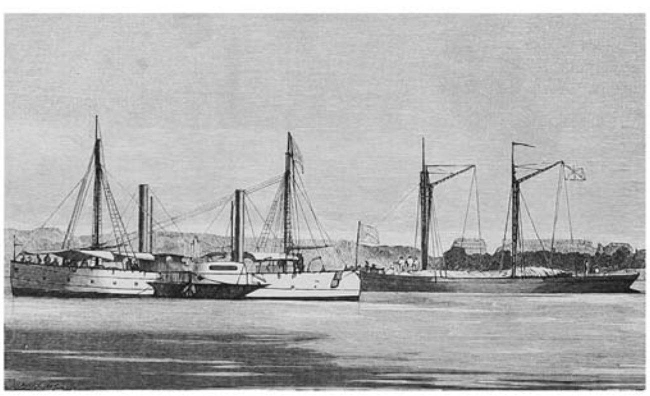

Fig. 5: Ships of Imperial Russian Navy's Aral Flotilla in the 1850s (Credit: Wikipedia)

By the eighteenth century, it came under Russian influence, who mapped the shoreline, measured depths, conducted meteorological and astronomical observations, and other scientific work and published the first map of the Aral Sea in 1850 (Fig. 4).

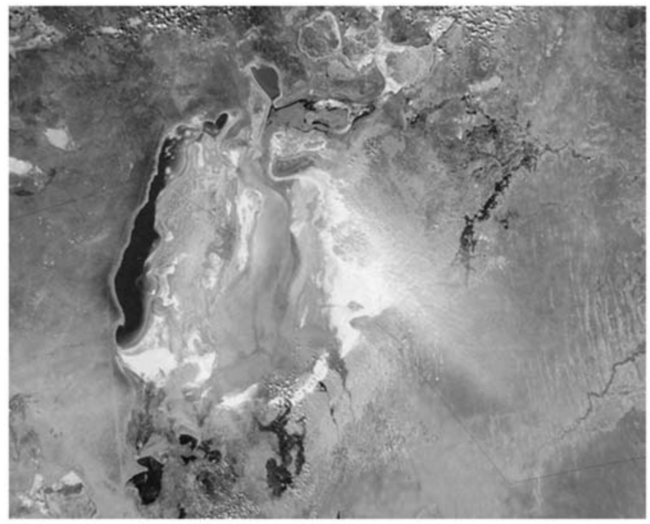

Fig. 8: A pale beige plume of dust blowing from the sediments of the South Aral Sea toward the southeast, along the Kazakhstan–Uzbekistan border. [Source: NASA Earth Observatory]

Its location was considered so important that ships were brought overland (on camels) and reassembled and launched on the sea (Fig. 5). Other steamships were brought in, and trading and fishing vessels were built locally. Its waters sustained thriving fisheries, with ports like Aral (or Aralsk, in the northeast of the Sea, in south-western Kazakhstan) and Muynak (or Moynaq, in the south of the Sea, in northern Uzbekistan) bustling with life. Fishermen caught species such as Aral salmon, bream, roach, carp, ruff, pikeperch, shovelnose sturgeon, etc., and provided a large harvest of caviar. In the best years, 50,000 metric tonnes of fish were caught in the Aral Sea, and by 1963, Muynak was granted the status of a city, with establishment of schools, hospitals, markets, and cinema halls, while its fishing industry employed thousands of people.

In the 18th and 19th centuries, the sea served as a strategically important source of fish for the Russian Empire and later for the USSR. Military bases and ports were located on its shores, and in the mid-twentieth century, a secret complex for testing biological weapons, including the microbial pathogens that cause plague, anthrax, Q-fever, smallpox, tularemia, and Venezuelan equine encephalitis, as well as botulinum toxin, was built on Vozrozhdeniya Island which was to create new ecological and epidemiological threats, when the island became part of the land, due to the drying up the Aral Sea.

The deserts around the Aral Sea get just about 12 cm of rain in a year, and temperatures during the long summers reach 40 degree C, or more. With these arid conditions, large irrigation projects were launched to increase cotton production during the Soviet era. These projects led to a catastrophic decrease in water flow to the Sea. The Aral Sea before and after these projects shows the stark difference between a thriving ecosystem and an environmental catastrophe. In the 1960s, water levels began to drop rapidly, and by the beginning of the 21st century, the sea was divided into several small bodies of water, most of which soon dried up completely.

The fishing industry went into decline. Factories started closing, the flotilla fell into disrepair, and thousands of fishermen and workers were left destitute. As the numbers of fish taken from the Aral declined in the 1980s, the Soviet government attempted to keep the local cannery open. The solution was to ship fish caught in the Sea of Okhotsk, in eastern Siberia, to the cannery in Muynak to keep the assembly line running. The Pacific being over 6,000 km away from Muynak, the fish had to be sent in refrigerated railcars, with the transport costs alone making it probably the most expensively produced canned fish in the world. After the collapse of the Soviet Union in 1991, this absurd practice stopped and the cannery closed, putting most of the local population out of work[2]. Many families were forced to leave the town in search of work, leading to a mass exodus. Muynak, once a thriving industrial hub, became a near-deserted outpost, surrounded by endless salt sands.

Thus, centuries of sustainable coexistence ended with 20th-century industrialisation.

On the other hand, irrigation of the arid region started yielding phenomenal quantities of cotton, which was called “white gold”. Yet, in the same period that cotton yields were increasing astronomically in the Uzbek and Turkmen SSRs (1960–1985), the amount of fertiliser applied to the fields was also exponentially rising. In 1985, farmers in the Uzbek SSR on average were dumping 285 kilograms of fertiliser on each hectare of land, with an almost-identical amount being applied to land in the Turkmen SSR. This was coupled with the use of dangerous pesticides (some mercury-based) and chemicals to control weeds. Much of this was washed off into the local drainage ditch adjacent to the fields—also the source of the water many people were using for drinking water. Unfortunately, the canals and irrigation channels were often not well-made, and a lot of water (25% to 75%) was lost due to leakage as well as evaporation. The flood irrigation system employed in what was an arid desert added to the woes.

Collapse and Consequences

By the 2000s, the Aral Sea had shrunk to 10% of its original size, splitting into toxic puddles (see Fig. 6). Salinity skyrocketed, wiping out fish species. Muynak’s ships now rust in desert sands, hundreds of km from water (Fig. 7). Evaporation from the former seabed contains pesticides, heavy metals, and salts that are carried hundreds of km by the wind (Fig. 8). This has caused an increase in illnesses among the local population and a general deterioration of the ecology of the region.

A real worrisome problem arose when the Vozrozhdeniye Island, a key location for Soviet biological weapons research and testing, including experiments with anthrax, plague, and smallpox, was abandoned, leaving behind hundreds of metric tonnes of live anthrax bacteria, buried on the island in the 1980s. As the Aral Sea began to dry, in 1999, viable anthrax spores were still found on the island, highlighting the persistence of these pathogens. In 2002, a US-led team cleaned up the anthrax burial sites to mitigate the threat.

No wonder, the UN Secretary General Ban Ki-Moon, upon seeing the dried-up Aral Sea[3], in 2010, said, “It is clearly one of the worst environmental disasters of the world... It really left with me a profound impression, one of sadness that such a mighty sea has disappeared,” and that, “It was a vivid testament to what [...] happens [...] when we waste our common natural resources, when we neglect our environment, when we mismanage our environment.”

In all this, the people lost their sea, their jobs, and their health.

Flickers of Hope

However, there is a glimmer of hope for at least a small portion of the Sea. As the waters in the Aral Sea dried, the sea divided into several parts, which were often isolated from each other. The northernmost of these, located in Kazakhstan, is now commonly called the “North Aral Sea,” while its counterpart in Uzbekistan is the “South Aral Sea.” In 2005, the Kazakhstan government, with the assistance of World Bank, completed the Kokaral (or *Kok-*

Fig. 7: The Graveyard of Ships [Credit: NASA Earth Observatory, Ismael Alonso, 2011]

Fig. 9: Dyke Kokaral in 2021 (Credit: Wikipedia)

Fig. 10: Saxaul trees planted in Aral "Desert" to stabilise soil and reduce dust storms

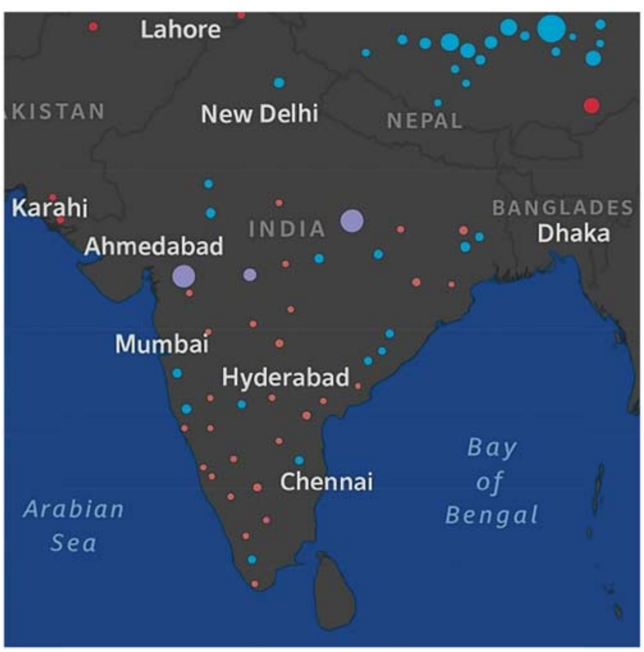

Fig. 11: Red dots denote major lakes of India which are drying up [6], while the blue dots denote the lakes, which are still safe.

Fig. 12: Major Ramsar Sites in India

Aral, Green Island) Dam, a 12 km long and 13 m high earthen dyke that separates the two remnants of the original sea (Fig. 9). It prevents water brought in by the Syr Darya from flowing southward into the South Aral, where it would be lost to evaporation. Water levels in the North Aral quickly increased to the point that a salt-tolerant species of flounder was introduced, and limited commercial fishing became possible. Over time, the salinity of the North Aral has declined, and indigenous freshwater fish have been introduced, such as the pikeperch, a valuable catch that is widely consumed in Kazakhstan. The annual fish catch has now reached about 8,000 metric tonnes. A plan to raise the height of dyke though, has not yet materialised. The South Aral, on the other hand, remains a wasteland, symbolising the limits of human remediation.

The Kazakh Ministry of Water Resources and Irrigation reported that by June 2024, the North Aral Sea had 21.4 billion cubic m of water, and it received up to 50 cubic m of water per second[4].

The remaining part of the Aral Sea (in the south) is now called Aral Kum (Aral Desert). Fortunately, it was found that planting the hardy, desert-adapted saxaul trees is one of the most effective tools to combat increased amounts of sand and salt that appeared due to the draining of the Aral Sea. Now it has been planned that saxaul trees (Fig. 10) will be planted on one million hectares of the drained bottom of the Aral Sea on the territory of Kazakhstan as part of the new effort to stop dust storms in the region.

Some Other Major Drying Lakes

Unfortunately, these are not the only two examples of vanishing lakes. Noteworthy examples are from different parts of the world include:

- **Lake Urmia** (Iran), the largest saltwater lake in Middle East has been rapidly drying due to diversion of over 90% of its feeder rivers (Zarrineh, Simineh, Aji Chay, and others) for agriculture (dams, canals). The decline is exacerbated due to climate change.
- It has lost ~70-80% of its original area (6000 sq km) since the 1990s; salinity has skyrocketed-which threatens flamingos & brine shrimp and increased salt/dust storms impacting health and agriculture) as in the case of the Aral Sea.
- **Lake Chad** (covering parts of Chad, Cameroon, Niger, Nigeria), has shrunk dramatically due to a combination of prolonged drought (caused by climate change) and significant diversion of inflowing rivers (especially the Chari/Logone system) for large-scale irrigation projects. It has lost ~90% of its 1960s size (25,000 sq km), which has devastated local fisheries, agriculture, livestock, and caused widespread humanitarian crises. The recent very unusual devastating floods have recovered the Lake partly.
- **Dead Sea** (Jordan/Israel/Palestine) is rapidly shrinking at the rate of 1 m/year due to massive diversion of the Jordan River (its main tributary) by Israel, Jordan, and Syria for water supply. It is leading to formation of sinkholes forming along shores, infrastructure damage, ecological changes.
- **Owens Lake** (called *Patsiata* by the displaced Mono people) in the Owens Valley, California during the pre-1900 period covered an area of approximately 280 sq km, with depths ranging from 6 to 9 m, and stored 1.6 billion cubic meters of water, brought in by the Owens River. In 1913, Los Angeles Aquaduct started diverting all the water from the Owens River away from the Lake. It went completely dry by 1926 and was reduced to a vast, exposed salt flat. It became the single largest source of PM10, coarse particulate matter dust pollution in the United States, emitting an estimated 4 million metric tonnes of dust per year which reduced visibility to near zero and carried particulate matter to hundreds of km. A concerted and very expensive method for dust mitigation involving shallow flooding (using limited water & groundwater), managed vegetation, gravel covers, and "tillage" (creating clods to trap dust) is now implemented covering an area of about 126 sq km, to protect the health of the people.

India has its own share of drying up lakes, and we mention just two of them, briefly.

- **Sambhar Salt Lake** (Rajasthan), once India's largest inland saline lake is critically shrunk and is drying up as the water of its primary feeder rivers; Mendha, Rupangarh, Kharian, Khandel was diverted for irrigation and urban water supply (notably to Jaipur). It is facing near-total desiccation, especially after poor monsoons (e.g., crisis in 2019) and threatens unique ecology (flamingos, migratory birds) and salt production.
- **Wular Lake** (Jammu & Kashmir), Asia's largest freshwater lake has significantly shrunk and degraded, due to the diversion of the Jhelum River (its main source) via multiple hydropower projects

upstream which reduce inflow. Massive siltation from degraded catchments blocks feeder streams. Willow plantation, land reclamation for agriculture, dumping of waste, and encroachments add to the problem so that it has lost a substantial portion of its area and volume and its area shrunk from 89.59 sq km in 1911 to 15.73 sq km in 2013. Moreover, reduced water holding capacity increases flood risk downstream and threatens biodiversity and local livelihoods (fishing, water chestnut harvesting). It is hoped that concerted mitigation efforts will revive it, or at least the part of it that survives.

A detailed study, using satellite data, of lakes drying up due to climate change, increasing evaporation, excessive withdrawal of water, industrialization, silting, and human activities like dumping of waste has been done by authors of Ref.[5]. Unfortunately, it does not reveal a hopeful picture, and it is reported that close to 30 lakes in India, 16 of them in southern India are drying up (see Fig. 11 and Ref.[6]). Moreover, climate change further exacerbates their decline, due to reduced snowmelts where applicable (e.g., in the case of Wular Lake) and increased evaporation from all of them due to rising temperatures.

Summary and Conclusions

We have seen that Tulare Lake and the Aral Sea are two examples of ecological ghosts, whispering of humanity's capacity for destruction. They are burning examples of the "Tragedy of the Commons"—a phenomenon when limited individuals use up all the economic resources that were to be shared by society[7], practiced via colonialist policies and economic and unscientific shortsightedness respectively, which led to cultural erasure. We have also seen that unfortunately, these are not isolated examples, and such stories have been and are still being repeated across the world. These stories urge us to balance ambition with humility and respect detailed scientific study and ensure that no more lakes vanish in the name of or with the excuse of progress.

We also noted that while Tulare Lake experiences "revenant" flooding occasionally, the Aral Sea has, most unfortunately, suffered essentially irreversible desiccation, which may take centuries to correct- even if all the water of Amu Darya and Syr Darya, starts flowing back into it. We wonder if other lakes mentioned and not mentioned here can be saved.

The intermittent flooding of Tulare Lake- or what once constituted Tulare Lake, reminds us of the recurring flooding seen in some of the large cities like Mumbai, Kolkata, Chennai, Delhi, and Bengaluru during heavy rains. While this is a vast subject requiring a separate discussion, we note that rapid and often unplanned expansion in these cities led to many low-lying areas, including many water bodies, being filled up and built over for development ignoring natural hydrology[8]. Water only "reclaims" them, whenever it gets a chance, as in the case of Tulare Lake.

Finally, we emphasize that with onset of climate change, the frequency, intensity, and unpredictability of extreme heat and excessive rainfall events will increase. Lakes, ponds, wetlands, and other water bodies, along with forests, will play a very important role during the crisis emanating from the more frequent, incessant, and erratic rainfall events and severe droughts by not only storing the erratic rainwater, but also by helping recharge the underground water and underground aquifers. It is imperative that we protect them, for our own survival. It is also important that we adopt integrated basin management to equitably allocate water across ecosystems/ agriculture and avoid wastage of water by using methods like drip irrigation and keeping leakage and seepage in check.

A very valuable and important step towards preserving large lakes and wetlands across the world has been taken by designating them as Ramsar Sites under the international environmental treaty signed in 1971 at Ramsar (Iran), for wise use of wetlands and their resources through national action and international cooperation. It puts them on the 'global map' for their importance in providing ecological services through an international network of wetlands, which are important for the conservation of global biological diversity and for sustaining human life, through the maintenance of their ecosystem components, processes and benefits. More than 2500 waterbodies have been recognised as Ramsar Sites across the world by 2024, out of which 91 are in India (Fig. 12).

We add that a close study of satellite images over time can alert us to the perils of drying lakes. One such study (Ref.[9]) has analysed over 3.4 million lakes on a global scale, including their explicit maximum extents and probability-weighted area changes over the past four decades, from the beginning period (1984–1999) to the end (2010–2019). It came up with the surprising result that the lake area increased across all six continents, which were analysed with a net change of +46278 sq. km. Looking closely, however, reveals a more worrisome result. About 56% of the increase was seen due to the building up large reservoirs or dams for the generation of electricity and irrigation. However, it is well-known that these large dams cause their own hardships, which increase in scope and intensity with the passage of time. Firstly, while the areas upstream may experience a rise in the water table, those downstream invariably show a lowering of the water table, in addition to causing serious damage to biodiversity and marine life. Large reservoirs lose a large part of their capacity due to siltation, and their water keeps getting more saline due to evaporation. Their contribution to the emissions of methane due to rotting vegetation is also well known.

A large part of the remaining increase in these studies could be attributed to an increase in the area (and even number) of glacial lakes[10] in the Himalayas (the Third Pole), Andes, Alaska, Rockies, Greenland, and Siberia, etc. The overflow and bursting of these lakes have been causing severe damage and loss of property, life, and infrastructure in (mostly) difficult terrains, and impacting the availability of fresh water.

The smaller lakes and ponds, which have been a lifeline in ancient India, especially the continental India, for millennia, by storing rainwater for lean months, irrigation, and even drinking water are, as we mentioned earlier, being filled over with trash and losing their capacity due to siltation. Again, as mentioned earlier, at least in urban areas, but now increasingly in rural areas as well, these are being built over, leading to stagnation of water during rains and flooding, as the rainwater has nowhere to go. It is painful to note that even saline water lakes see a rapid decline in their area due to the dumping of trash and evaporation.

As we navigate an era of environmental crises, let these "vanished and vanishing" waters, as well as the "emerging and expanding glacial lakes" due to climate change, guide us toward a future where humans and nature thrive together.

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