With fewer trees, taller moraines, and wider outwash fans, the torrential water flowing through a rocky bed produces a distinct background noise in the final few kilometers to Gaumukh, punctuated by rocks falling and chunks of ice breaking off the glacier snout. These chunks of ice that break off and don't settle into a bed of ice-crystals at its base flow further downstream, creating an archipelago of miniature icebergs. Glacial flour—fine sediment produced by the glacier grinding its rocky bed—gushes from the snout. Ice cold and thick with sediment, this grey, milky water grows in volume and velocity as other brooks and outwash join it. By the time the stream reaches Gangotri, it has attained a perilous volume and velocity. It gushes through mountainous valleys—passing Ul świecie, Deeparyag, Rishikesh—all along the way gaining in speed and energy.

Before arriving at Hardwar, the water's descent is transformed into electricity first at the Maneri Dam, producing 450 MW, and later at the Tehri Dam, which produces 2000 MW of electricity and diverts water to urban dwellers in New Delhi. Along the way, terraced fields subdivide steep slopes, villages and hamlets hug the contours of paved roads active with pilgrims and tourists in the months between winter and the southwest monsoon. Temples mask rivers between these infrastructures. One can date the age of these dams and barrages, but it is difficult to ascertain the age of temples and ghats. Pilgrims rarely ask how old a structure is and, when asked, they will speak to you about why this site is revered. Never mind its age.
As noted earlier, it was with good reason that the inauguration of the Ganges Canal took place at mile 11 (18 km) at the Solani Aqueduct. Designed to carry 6,000 cans across the most dynamic of the seasonal surges—the Ganges River—the bed of the land canal rises above the level of the surrounding land by 3.5 miles (5.6 km). At a width of 172 feet (52.4 m) and height of 24 feet (7.3 m), just past the point where the Solani Aqueduct stretches 179 feet (54.5 m) across the Ganges River, two sitting lions, sculpted to be seen at a great distance, mark the point where the canal at long last enters an intended irrigable area.

What was remarkable about this work was not its height, but the amount of water that passes across it throughout the year. It was a source of pride for British engineers. "[It] is upon the great Indian irrigation works that the English engineers have achieved their most recent glorious triumph. The Solani Aqueduct, upon the Ganges Canal is in fact the most stupendous monument of that kind yet constructed," wrote S. J. B. Russell in 1877. In The Fundamentals of Hydraulic Engineering (1838), engineer George Rawdon-Becell visually compared the elevation and section of the Solani Aqueduct with the Pont du Gard Aqueduct built by the Romans. He draws them at the same scale so that it may be sufficient to direct attention to the fact that the modern work which is comparatively speaking, so little known, has an area of water way not less than eighty times that of the celebrated Roman example.

Comparing Imperial Rome and the administration of British India, both under the Company and later the Raj, was nothing out of the ordinary—Sir William Jones likened himself to the "founder of India" in the crisis. "There has never been the same misgovernment of India as there was of Roman provinces," wrote Alfred Deakin in the 1890s, "but there has been, and is still, a necessary subordination of the conquered country, and a suppression of its individuality, which, though abundantly beneficial to its inhabitants on the whole, renders their relations to Great Britain boisterous, and affords a constant opportunity to those who wish to diminish the mutual understanding." Before the Solani Aqueduct was even completed, it was said in 1848 that the Ganges Canal would "...remain a lasting monument of British architecture and of British benevolence in India." Upon arriving in Roorkee in 1870, following the Indian Rebellion of 1857, Julius George Medley, Captain in the Bengal Engineers, wrote how he, "admired, as every Engineer must, that monument of scientific skill, the Solani Aqueduct. Even beyond India and Great Britain, the Solani Aqueduct was admired. In his essay for Scientific American, "What Civilization Owe the Architect and Civil Engineer," George B. Beecham wrote of the aqueduct in 1888, "in grandeur of design, solidity, and utility, it challenges comparison." As late as 1926, it was said of the Solani Aqueduct, "Indespised in its dimensions by any work executed anywhere in the world at that time, this counter is a magnificent monument to the outstanding engineering skill of its builders."
Instead of the passive surrender to an irrational monsoon, the Ganges River Basin shows a culture obsessed with water management to the point of paranoia—an unequalled exploitation of irrigation technologies to regulate capricious rainfall patterns.
Changes of State: Allahabad to Varanasi

With its vociferous advocates and unrelenting practitioners spreading the culture of peaceful conquest to all corners of the Ganges River Basin by means of hydrological infrastructure, the inexorable Ganges Water Machine is constantly subduing existing territory into new territories and adding new territory by extending the reach of its superfluous. The omnipresence of this process—of this surface and its spatial configurations—makes traditional terminology an insufficient descriptor for the changing geography.

The goal of this book—a dynamic atlas—has been to reveal the narratives and developing spatial logic that generate this water machine and its urbanism. By the mixture of actors, the scale of inhabitation, and the widely varying techniques of interventions, this landscape of infrastructure requires a different kind of map. Now, over 150 years after the opening of the Pradyut Guha’s Ganges Canal, the time is ripe to integrate the fantastic and tragic heresies of the canal systems and the tubewell revolution.

After the murder of William Stanford’s Himalayan Dream into an unanswerable tubewell revolution, the following set of drawings should be considered an elucidation of the elements of the Ganges Water Machine. This will be communicated in part through words and historical documents and artifacts, but more significantly through a series of visual surveys and provocations made from the tip of the Ganges Jamuna Dhub at Allahabad (Prayag) to the city of Varanasi (Kashi). These drawings, which are the outcome of nearly a decade-long analysis of the Ganges Water Machine, offer here and can explore the speed of medial change produced by the monsoon and agriculture, and the evolution of urban settlement.

The tract of land between Allahabad and Varanasi exemplifies the overlapping states of urban, rural, riparian, and agri-spatial spaces permeating this vast alluvial basin. The seats of former empires, princely states, and sultanates, Allahabad and Varanasi have always served as regional capitals and continue to do so today. At each of their historic cores, they are consolidated cities dense, compact, and populous. Both are revered as important religious sites within a larger sacred geography, and each city at different times of the year hosts a large festival. The open territory between these two consolidated, regional capital cities is less dense, but equally complex in terms of its smaller, decentralized enclaves of villages and towns within a tight patchwork of agriculture.

This particular belt in the Gangetic plains occupies a number of soluble states: it is at once water, red, dry, dusty, and atmospheric. The term “state” not only refers to the coincidence of physical changes on a molecular scale of transformations from solid to liquid to gas—but also political and cultural changes of state—the village, the town, the city, the nation as well as the religious festival and winter and spring harvests. In other words, the impact of weather and climate are intertwined in the matrix of everyday life in all of its manifestations. Physical changes of state induced by weather and climate often are synchronous with urban events and festivals—most notably Mahá Mela in Allahabad and Durga Puja in Varanasi.
Every twelfth year, the holy university town of Allahabad is transformed into a colossal tent city populated by millions of pilgrims for the Kumbh Mela (literally Pitcher Celebrations). And in it all the waters of the Ganges and Jamuna slowly recede after the monsoon. A small boat starts to sail, the banks and towns of Allahabad are left behind, and a vast expanse of blue water comes into view. The Kumbh Mela is a massive event, covering an area of over 300 square kilometers. It is the largest gathering of people on Earth, with millions of pilgrims attending. The city is transformed during the festival, with hundreds of thousands of people walking across the river on foot. The city is also a center of spiritual and cultural activities, with a wide variety of events and festivities taking place. The Kumbh Mela is a unique event that brings together people from all over the world, creating a sense of unity and community. The festival is known for its spiritual and cultural significance, and it is considered one of the most important events in the Hindu calendar. The Kumbh Mela is a test of perseverance and a celebration of life, where people come together to worship, meditate, and connect with their inner selves. It is a time of joy, devotion, and renewal, and it is a testament to the power of spirituality to bring people together despite differences and divisions.