

# A Water Crisis Is on the Horizon. The World Must Take Action



by Thin Lei Win



The Angkor. The Mayans. The Indus Valley.

A common element played a crucial role in the rise and fall of these ancient civilisations: water. Their ability to control, manage, and utilise water, through intricate networks of reservoirs, canals and storage facilities, allowed them to build thriving societies. They helped agriculture to flourish all year round and sustain large populations, whether to cultivate rice in Angkor in what is modern-day Cambodia, maize and beans in Central America for the Mayans, or wheat and barley in the Indus Valley in South Asia.

It was also water that doomed these civilisations. A combination of misuse and environmental changes, such as shifts in monsoon patterns and severe, prolonged droughts, contributed to

their decline, research has shown.<sup>1</sup> Mass migration and the abandonment of urban centres ensued. Centuries on, these civilisations continue to fascinate and captivate scholars and ordinary people alike, yet the world seems to have missed the most relevant lesson: water security is key to stability and prosperity.

<sup>1</sup> The Earth Institute, "Did Climate Influence Angkor's Collapse?", in *The Earth Institute News*, 29 March 2010, <https://www.earth.columbia.edu/articles/view/2661>; Joseph Stromberg, "Why Did the Mayan Civilization Collapse? A New Study Points to Deforestation and Climate Change", in *Smithsonian Magazine*, 23 August 2012, <https://www.smithsonianmag.com/science-nature/why-did-the-mayan-civilization-collapse-a-new-study-points-to-deforestation-and-climate-change-30863026>; Emma Marris, "Two-hundred-year Drought Doomed Indus Valley Civilization", in *Nature*, 3 March 2014, <https://doi.org/10.1038/nature.2014.14800>.

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Not only is water essential for the functioning of the human body, it is also the basis of agriculture, which is especially important as the global population inches northward of 8 billion people. A community's fortune is directly related to its proximity and access to safe, clean water, whether to prevent the spread of waterborne diseases, improve sanitation and hygiene, or power industrial processes, energy production and transportation.

Unfortunately, a water crisis is brewing due to a potent mix of climate change and mismanagement (from overuse and contamination to inequitable distribution and the destruction of watersheds). Roughly half of the world's population is already experiencing severe water scarcity for at least part of the year.<sup>2</sup>

Yet water security and governance often take a back seat in international and national discussions around food, climate change and security, even though experts have called the climate crisis "a water resilience crisis".<sup>3</sup> The

topics remain under-researched. The 2015 Paris Agreement did not mention water once.<sup>4</sup> Recommendations from the 2021 UN Food Systems Summit did not fully address the role of water. In March 2023, the United Nations finally convened the first global conference on water in 50 years, but there were no binding resolutions.

The presence of separate policies, agencies, and funding streams for water, agriculture, and environmental protection also often leads to "fragmented approaches where water security is not adequately integrated into food security strategies", said Nathaniel Matthews, Visiting Professor at King's College London and former Chief Executive Officer of the non-profit Global Resilience Partnership.<sup>5</sup>

Water must become a key part of climate negotiations and food security discussions at all levels. Governments, corporations and individuals must share a collective responsibility in the usage and protection of water resources. Failure to collaborate in the effective managing and distribution of this finite resource is likely to have severe repercussions on global hunger and climate action.

### *The water-food-climate nexus*

The sixth assessment report of the Intergovernmental Panel on Climate Change (IPCC) has already warned that drought and flood risks and societal damages from these disasters

<sup>2</sup> IPCC, *Fact Sheet: Food and Water*, October 2022, [https://www.ipcc.ch/report/ar6/wg2/downloads/outreach/IPCC\\_AR6\\_WGII\\_FactSheet\\_FoodAndWater.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/outreach/IPCC_AR6_WGII_FactSheet_FoodAndWater.pdf).

<sup>3</sup> Nathaniel Matthews et al., "Elevating the Role of Water Resilience in Food System Dialogues", in *Water Security*, Vol. 17 (December 2022), Article 100126, <https://doi.org/10.1016/j.wasec.2022.100126>; International Water Management Institute, *Water Governance for Resilient Food Systems for Future Climates*, September 2021, <https://www.iwmi.cgiar.org/wp-content/uploads/2021/09/water-resilient-food-systems-statement.pdf>; Dietrich Knorr and Mary Ann Augustin, "Vanishing Water: Rescuing the Neglected Food Resource", in *Food Engineering Reviews*, Vol. 15, No. 4 (December 2023), p. 609-624, <https://doi.org/10.1007/s12393-023-09349-z>.

<sup>4</sup> UNFCCC, *Paris Agreement*, 12 December 2015, <https://unfccc.int/node/512>.

<sup>5</sup> Interview with the author, April 2024.

are expected to increase with every degree of global warming. In large areas of northern South America, the Mediterranean, western China and high latitudes in North America and Eurasia, “extreme agricultural droughts” may become increasingly common as global temperatures rise: they could be at least twice as likely with a 1.5°C warming, 150 to 200 per cent more likely at 2°C, and over 200 per cent at 4°C.<sup>6</sup> Agricultural drought happens when soil moisture is low and insufficient for plant growth, causing crops to dry out, wrote the European Union’s Copernicus programme.<sup>7</sup>

This creates a dilemma: the world will need more water to grow crops and raise animals just as it becomes scarce. The most tangible and pressing impacts could indeed emerge in food production.

Agriculture is already the largest user of water worldwide, accounting for more than 70 per cent of freshwater withdrawals.<sup>8</sup> In some developing countries, agriculture’s water usage can be as high as 95 per cent. On average, it takes 1,432 litres of water to produce a kilogram of rice in an irrigated lowland production system,<sup>9</sup> nearly 6,000 litres

for a kilogram of pork, and more than 15,000 litres for a kilogram of beef.<sup>10</sup>

Farming is also a major source of water pollution, arising primarily from the run-off of nutrients, pesticides and other contaminants into water bodies, and posing potential risks to both human and planetary health. At the same time, water-related disasters, particularly drought and scarcity, are already wreaking havoc on nations rich and poor.

In Malawi, Zimbabwe and Zambia, a severe drought linked to El Niño has wrecked crops, pushed up food prices, and caused an estimated 20 million people to face acute hunger. In Asia, a “punishing heat wave” has threatened the production of wheat and other crops in India and caused rice prices to soar in Indonesia. Rain deficit and record-high temperatures in January 2024 had an impact on both shores of the Mediterranean, hitting winter crops and fruit trees on the coasts of Spain, Italy and Greece, and causing a reduction in crop growth in Morocco and Algeria, as reported by the EU’s Joint Research Centre.<sup>11</sup>

Yet the world has been extracting water as if it is an inexhaustible resource. Over the last century, global water use has increased at more than twice the rate

<sup>6</sup> IPCC, *Fact Sheet: Food and Water*, cit.

<sup>7</sup> Copernicus, *Observer: What Impact Does Drought Have on Vegetation, and How Does Copernicus Help?*, 5 March 2020, <https://www.copernicus.eu/en/node/8499>.

<sup>8</sup> UN Water, *The United Nations World Water Development Report 2024. Water for Prosperity and Peace*, Paris, UNESCO, March 2024, <https://unesdoc.unesco.org/ark:/48223/pf0000388948>.

<sup>9</sup> Rice Knowledge Bank website: *How to Manage Water*, <http://www.knowledgebank.irri.org/step-by-step-production/growth/water-management>.

<sup>10</sup> Heike Holdinghausen, “Water: Thirsty Animals, Thirsty Crops”, in *Meat Atlas 2021*, September 2021, <https://eu.boell.org/en/node/8903>.

<sup>11</sup> Joint Research Centre (JRC), *Prolonged Drought and Record Temperatures Have Critical Impact in the Mediterranean*, 20 February 2024, <https://joint-research-centre.ec.europa.eu/node/9424>.

of population growth.<sup>12</sup> In the United States, a groundwater crisis is looming, mainly as a result of overexploitation, including from agriculture.

Furthermore, as awareness of water stress rises, it is critical that adaptation actions in one country do not worsen the situation in another. For example, if India's water-short farmers were to adopt more efficient methods of irrigation, cutting evaporation from their fields, farmers in East Africa might see less rainfall and worsening drought, as evaporation and subsequent moisture flows from large-scale irrigated farming in India contribute up to 40 per cent of rainfall in East Africa.<sup>13</sup> In turn, a reduction in rainfall in key months could have knock-on effects on crop productivity, food security, and migration, that might lead to wider repercussions including social unrest.<sup>14</sup>

"We face a systemic crisis of water, which is both local and global", the Global Commission on the Economics of Water, a group of experts, community leaders, and policymakers, wrote in its landmark report last year.<sup>15</sup> The same report added that demand for

freshwater is expected to outstrip its supply by 40 per cent by the end of this decade.

### *Elevate, collaborate, adapt and mitigate*

Averting this crisis requires water to become a key part of the discussions on climate, food and biodiversity, from the UNFCCC-led annual climate negotiations to the next Food Systems Stocktake. It means mainstreaming water security and governance across all aspects of public policy. It means abandoning a myopic focus on short-term economic wins.

As water resources continue to dwindle, merely adjusting to scarcity won't address the underlying issue. Indeed, latest research findings show that water-related adaptation becomes less effective as warming increases.<sup>16</sup> Urgent efforts must be made to reduce demand and usage across agriculture. The Global Commission on the Economics of Water has recommended nations "must phase out some USD 700 billion of subsidies in agriculture and water each year, which tend to generate excessive water consumption and other environmentally damaging practices".<sup>17</sup>

Reforming subsidies is a crucial but knotty issue, so it could be accompanied by country-level efforts to encourage and promote water-

<sup>12</sup> United Nations, *The Sustainable Development Goals Report 2019*, New York, United Nations, 2019, p. 35, <https://unstats.un.org/sdgs/report/2019/goal-06>.

<sup>13</sup> Patrick W. Keys et al., "Anthropocene Risk", in *Nature Sustainability*, Vol. 2, No. 8 (August 2019), p. 667-673, DOI 10.1038/s41893-019-0327-x.

<sup>14</sup> Thin Lei Win, "Researchers Warn of 'Unexpected Implications' as Climate Risks Converge", in *Reuters*, 22 July 2019, <https://www.reuters.com/article/idUSKCN1UH1UZ>.

<sup>15</sup> Mariana Mazzucato et al., *Turning the Tide. A Call to Collective Action*, Paris, Global Commission on the Economics of Water, March 2023, p. 11, <https://watercommission.org/?p=8410>.

<sup>16</sup> Tabea K. Lissner et al., "Effectiveness of Water-related Adaptation Decreases with Increasing Warming", in *One Earth*, Vol. 7, No. 3 (15 March 2024), p. 444-454, DOI 10.1016/j.oneear.2024.02.004.

<sup>17</sup> Mariana Mazzucato et al., *Turning the Tide*, cit., p. 7.

saving technologies. Tried-and-tested methods include drip irrigation (which distributes water directly to plant roots by dripping water onto the soil at very low rates), collecting and storing rainwater for agricultural use, crop rotation (growing different types of crops in the same area), which retains soil moisture and water, and growing trees on farmland and pastures to conserve water.

Collaboration and cooperation across agencies, ministries and non-governmental organisations, both at the national and international levels, is also crucial. The G7 has already taken a positive step towards this. The recent joint communiqué from the G7 Climate, Energy and Environment ministers included a pledge to establish a G7 Water Coalition “to tackle the global water crisis” and which organises at least an annual meeting on the topic.<sup>18</sup>

More such efforts are needed: approximately 40 per cent of the world’s population lives in transboundary river and lake basins, many of which are in areas of current or past interstate tensions, but only a fifth of countries have cross border agreements to jointly manage these shared resources equitably, wrote the UN.<sup>19</sup>

Africa, in particular, could benefit. A significant number of states suffer from water scarcity while two-thirds

of the continent’s freshwater resources are transboundary. Aside from the G7’s new pledge, efforts on regional cooperation are still embryonic but there are promising signs that world leaders are becoming more aware of the importance of transboundary water management to optimise water use. In Asia, the International Centre for Integrated Mountain Development (ICIMOD), a body comprising eight nations along the Hindu Kush Himalaya, has called on governments to use climate change “as the urgent catalyst for collaboration over three key river basins in Asia: the Indus, the Ganga, and the Brahmaputra”.<sup>20</sup>

The responsibility to improve water security, however, does not rest only with governments and corporations. Actions at community and individual levels also play a role. Reducing food waste, for example, saves water indirectly since producing food requires significant volumes of water. Consuming fewer thirsty crops and meat and eating more seasonally is another option.

Overall, the combination of innovative technologies, centuries-old knowledge and established best practices – large-scale water conservation and recycling programmes, restoring wetlands and watersheds, investing in water storage and distribution infrastructure, just to give a few examples – could go a long way in ensuring water security for the current and future generations.

<sup>18</sup> G7, *Climate, Energy and Environment Ministers’ Meeting Communiqué*, Torino, 29-30 April 2024, point 33, [https://www.g7italy.it/wp-content/uploads/G7-Climate-Energy-Environment-Ministerial-Communique\\_Final.pdf](https://www.g7italy.it/wp-content/uploads/G7-Climate-Energy-Environment-Ministerial-Communique_Final.pdf).

<sup>19</sup> UN Water, *The United Nations World Water Development Report 2024*, cit.

<sup>20</sup> ICIMOD, *Future of One Billion People and Globally Significant Ecosystems Relies on Collaboration over Indus, the Ganga and the Brahmaputra*, 20 March 2024, <https://www.icimod.org/?p=66108>.



Water security and governance, however, is not just a technical issue. Water is “a global common good, to be protected collectively and in the interests of all”, to quote the Global Commission on the Economics of Water.<sup>21</sup> This collective responsibility, together with collaboration, equitable management of shared water sources, innovative solutions and learning from the past, would help the world to chart a course toward resilience and prosperity, ensuring a future that transcends the fate of past civilisations.

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<sup>21</sup> Mariana Mazzucato et al., *Turning the Tide*, cit., p. 7.

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