

Water as a Resilience Multiplier for an Inclusive Indo-Pacific



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In concluding the September 2021 Quad meeting with the heads of India, Australia, and Japan, President Biden **proclaimed** that “the future of each of our nations—and indeed the free world—depends on a free and open Indo-Pacific enduring and flourishing in the coming decades.” As the world’s most dynamic and populous region, the Indo-Pacific is full of potential, but it is not without its challenges. Almost all of the Indo-Pacific nations have “**difficult hydrologies**,” which present persistent and long-term structural challenges for development. Climate change is exacerbating these challenges still further as novel, previously unexperienced climate conditions emerge across the region more quickly than predicted by groups such as the IPCC. Continued economic fallout from the COVID-19 pandemic, coupled with global supply chain disruptions, geopolitical instability, and record high food prices threatening to undermine worldwide development gains of the past 30 years, and aggravating the situation still further. Clearly, new approaches to building and sustaining water security for growth and development are needed urgently.

Additional water-sector investment has been identified as a clear gap. The **benefit-cost ratio** of investments in water and sanitation infrastructure in least-developed countries such as Lao PDR or the Solomon Islands can be as high as 7 to 1, allowing for greater economic opportunities, income generation, and poverty reduction. While the Indo-Pacific has made historic gains in access to water, sanitation and hygiene over the past 25 years, as of 2019, over a **billion people** in the region still do not have reliable access to water, sanitation, and hygiene (WASH) services, while existing water service providers struggle to keep up with ever-increasing demand.

Rapid urbanization continues to strain the limits of water infrastructure in cities like Manila, Dhaka, and Karachi, where over 40 **percent** of the urban populations already live in slums without access to safe, clean, and reliable drinking water and sanitation supplies. According to the **AIIB**, over 770 million cities and urban settlements in Asia are now annually exposed to flood risks. At the same time, traditional water sector investments are not enough to cope with emerging climate and development challenges.

There are unintended water consequences of longstanding development policies too. Subsidized fuel sources have accelerated the use of groundwater pumping in Pakistan and India, causing rapid aquifer depletion. Groundwater consumption are, ironically, creating significant flooding issues in Hanoi and

Jakarta through subsidence. In rural areas, expanded groundwater pumping has increased the feasibility of irrigated agriculture, which has an overall positive effect on food security in the short term. Such pumping is almost universally unregulated and has led to widespread **overextraction**, sometimes exacerbated with “clean” solar-fueled pumps. As groundwater often provides a back-up source of water during periods of surface water scarcity, the loss of these aquifers is particularly alarming and may produce the perverse result of undermining food security over the medium to long term.

Increased water-related climate risks for Indo-Pacific nations

Most of the region is already **highly exposed** to water related climate risks including melting glaciers, more frequent and intense typhoons or cyclones, sea level rise, and more powerful droughts. Such risks affect the ability of water service providers to maintain reliable and profitable operations; these challenges for water services are only increasing. According to a recent OECD **report**, in order to meet their sustainable development targets under SDG 6, most Indo-Pacific countries will need to allocate between 1 and 2 percent of their GDP on water supply and sanitation infrastructure over the next decade. Given that most water infrastructure is designed to last for fifty years or more, uncertainty about future climate is a serious threat to planning and designing resilient infrastructure. Many countries may in effect be investing in designs and systems that are outdated at the time that they launch operations because they depend on a traditional and widespread past-predicts-the-future planning methodologies.

Low-lying Pacific nations such as Timor-Leste and the Marshall Islands, meanwhile, face the threat of losing their entire land base. As the finance minister of Tuvalu **warned** at the 2021 UN Climate Conference in Glasgow: “It is not fiction, it is not projected to happen in the future—our land is fast disappearing. Tuvalu is literally sinking.” At the same time, Pacific Island countries are at the **forefront** of taking action against climate change themselves. They are developing and mainstreaming climate adaptation and resilience solutions, including resilient water infrastructure. Given the implications of mass displacement on regional stability and security, efforts to ensure their survival

should be viewed as a strategic national priority for the United States and its G7 partners.

Rethinking investments in water resilience

Most investment processes mobilizing intra- and international resources and both public and private investors are often using business-as-usual frameworks for nontraditional and often complex problems. Building up infrastructure alone may also be insufficient for ensuring that issues around equity and the promotion of a strong civil society grow in tandem with infrastructure services. Strengthening societal resilience to confront unpredictable shocks and stressors requires a transformation in how to invest in the future. Planning for resilience requires reducing the emphasis on achieving highly optimized, predictable outcomes and increasing the adaptive capacity of our economies, policies, financial institutions, ecosystems, and physical infrastructure in order to help them to withstand and adjust as conditions change. If investments are to deliver inclusive, equitable, and environmentally sound growth for low and middle income countries in the Indo-Pacific region, they must embrace a resilience perspective.

Water has been recently emerging as a kind of organizing principle for climate adaptation and resilience projects, perhaps notably in the call for “water-based adaptation” for all sectors by the Intergovernmental Panel on Climate Change (IPCC) **sixth assessment report**. Water resilience, in particular, has been identified by the **Global Commission on Adaptation** as a key enabler of broader societal resilience. Both the **Asian Development Bank** (ADB) and **World Bank** have begun to mainstream water resilience within their broader investment portfolios. The PRC-backed Asian Infrastructure Investment Bank (AIIB) has also developed a new water infrastructure investment **strategy**; however, it remains to be seen how this new strategy will guide the AIIB’s investment since only four water infrastructure projects have been approved since its adoption in late 2020. Likewise, major water reforms at the Green Climate Fund (GCF) have only just been **realized**; implementation through water projects to date around water resilience has been limited but could change dramatically.

Moving Beyond Crisis: Developing Systemic Solutions for Systemic Threats

Water resilience must be a key part of ensuring the future growth of the Indo-Pacific, and water resilience must also be integral to the strategy to promote sustainable growth. Most water interventions by donor countries have focused on traditional WASH (water sanitation, hygiene, and health) projects, such as expanding urban water utilities or provisioning rural household clean water programs. These programs will remain regionally important and indeed have expanded through internal investment processes, such as India's aggressive engagement with SDG 6. Water resilience, however, is an approach that seeks to transform sector- and ministry-specific programs designed to expand specific areas of growth, such as energy generation capacity, to defining the water linkages between sectors and ensuring that these programs are invested with attention to the potential synergies and conflicts. Recognizing the transformative, disruptive role of climate change is central to water resilience.

Water resilience assumes three factors, namely:

1. Climate change is a new and unfamiliar disruptive force that will influence the region in profound ways for at least decades to come. While the existing political and economic systems are designed for a “stationary” (i.e., fixed) climate, climate change is rapidly stranding infrastructure, governance, and policy agreements as often unspoken assumptions about “normal” climate conditions are profoundly violated. Climate change is, in effect, a profound threat multiplier.
2. Water is arguably the medium **of most negative climate impacts**, and many of these impacts are challenging to predict with the accuracy necessary for traditional planning, design, and operational functions.
3. Infrastructure for energy production, data processing, storage, transportation, manufacturing, clean water, and the food system last over **climate-relevant lifespans**, ranging from a few decades to a century or longer, but they are not designed for the range of climate conditions they will face over these periods. While existing infrastructure and policy

systems are declining in functionality as a result of essentially unforeseen climate impacts, new investments and approaches remain unlikely to go beyond **de-risking a narrow set of climate impacts**. Thus, new clean energy or sustainable forestry programs may be rapidly left behind with accelerating climate change, losing efficiency or even experiencing damage as a result of novel events. In some cases, trade agreements and transboundary resource sharing frameworks may be undermined by the same kinds of climate risks as infrastructure.

There are no quick fixes to issues related to water risks. Indonesia is essentially abandoning its national capital as a result of flood issues, while the scope of 2022 flooding in Pakistan—most often viewed as a water-scarce country—shows many climate impacts are nonlinear and very challenging to anticipate. Island nations in both the Indian and Pacific oceans face potentially existential challenges from the pinch of scale of severe freshwater scarcity for all sectoral use, intense tropical cyclones, and rising sea levels, which so far have largely seen solutions that are either small relative to the scope of the problems or so expensive as to present significant economic challenges simply to maintain current conditions.

Water resilience is a comprehensive approach to these issues, and one in which donor aid and a community of regional learning and capacity building can be catalytic. Moreover, water resilience relies on actively engaging with civil society and a vision of infrastructure and policy investments embedded in a social-ecological context. Water resilience at its core recognizes that not all economic development problems can be engineered and that long-term solutions almost always require a mixture of built, hybrid and green, and governance options. One group has also referred to these approaches as **“deep resilience.”**

Some policymakers have highlighted the transition to a water resilience approach. In March 2022, the IPCC stated that **“water-based adaptation”** should be the core focus of most adaptation and resilience interventions globally. California Governor Gavin Newsom identified water issues as an **existential threat** to the basis of much of his state’s economy, including the gradual loss of summer water storage in snowpack (extending and intensifying the dry season), the emergence of a 1200-year scale “drought,” water governance systems designed to fit a long-past economy and a much lower population size,

and the threat of increasingly extreme pluvial flood events, in addition to unprecedented wildfires and exceptional heat that stresses the state's energy system. Many of these issues have resonance throughout the Indo-Pacific.

Newsom's essential focus, beginning with a 2019 **executive order**, has been to reorient state agencies to water resilience. Beginning in August 2022, Newsom announced a new **state water plan** that transitions state policies and programs **“away from a scarcity mind-set to one more of abundance.”** That is, how can the state radically adapt to emerging climate conditions, especially around water scarcity, in ways that can actually fuel prosperity and attract additional social and capital investment? If climate change is a threat multiplier, California has clearly identified water as a “resilience multiplier.”

In the Indo-Pacific, Singapore has developed an arguably longer track record along very similar lines. According to a recent **national report**, Singapore clearly demonstrates that a lack of abundant local water resources need not be an obstacle to successful economic development:

Water has always been an existential issue for Singapore. Singapore is classified as being water scarce and as the most water-stressed country in the world, according to the World Resources Institute's 2015 report. We also rank 170th out of 190 countries in terms of freshwater availability, according to the first UN World Water Development Report in 2002.

Yet because of Singapore's strategic prioritization of water for economic development priorities, water has not been a significant limiting factor for the country for many decades.

Operationalizing Water Resilience for the Indo-Pacific

There are five ways that can enhance water resilience in the Indo-Pacific while also leading to greater social and economic security, namely:

1. Promoting water resilience leadership: the 2015 UNFCCC Paris Agreement created a new framework for economic development in the form of five-year periodic national climate planning and reporting systems called NDCs or Nationally Determined Contributions. The

NDCs defined a new class of national level climate planners (NDC focal points) who report national climate ambitions to the global community. Perhaps more importantly, the NDC focal points also look across sectors and ministries to identify potential gaps and synergies from a climate perspective. A number of countries and both UN, donor, and NGO actors have called on the NDCs to be drivers of water resilience that can align the water and climate agendas and enhance the ambitions around climate action. Indeed, at least one collaborative global donor-funded program has started to build this capacity within national parties, while the UNFCCC itself is conducting a certification program for NDC focal points on water-based adaptation and resilience. Existing capacity-building and education efforts such as the Quad Fellowship or the ADB-Japan Scholarship Programme could be expanded to include funding for the recruitment and development of individuals from a variety of technical and policy backgrounds. Arguably, these approaches should also be extended to other policy frameworks, such as transboundary water sharing agreements (e.g., India-Pakistan, the Lower Mekong River, following patterns already apparent in the Zambezi, Danube, and Colorado Rivers), which all appear quite sensitive to violations of assumptions as the water cycle continues to evolve rapidly in unplanned directions. PGII could very tangibly support the process of preemptively ensuring that these agreements will remain durable under a wider range of conditions in ways that lead to guidance for new institutions and processes to avoid conflict and insecurity.

2. Addressing the cost of water resilience: Water-centric economic planning and management is an important perspective for how to approach resilience between and within sectors. Traditional macroeconomic approaches by finance and economic ministries (including Integrated Water Resources Management [IWRM] and water-food-energy nexus [WEF] methodologies), have focused on efficiency and optimization for critical resources and outputs, but “efficient” solutions may also be “brittle” and prone to failure if basic climate assumptions are violated. Efforts to develop capacity and promote macroeconomic planning, monitoring, and evaluation that addresses water resilience as a key

additional quality in addition to efficiency and optimization could be transformative across the region. The reverse is also true: when countries over optimize without considering potential climate impacts, especially around high-uncertainty resources such as water, disruptions can trigger a downward economic spiral or even disinvestment. These risks may be heightened as developing economies transition from water-intensive agricultural commodities to preparing for manufacturing economies by increasing energy generation capacity via water-intensive sources. Such hidden water insecurity may be most prominent in energy systems. Much of South and southeast Asia falls into these categories, certainly for hydropower development (Bhutan, Nepal, Vietnam, Thailand, Laos), but also with the construction of new coal-fired, natural gas, and hydropower plants (e.g., India, Pakistan, China).

3. Enhancing stakeholder engagement for defining problems and coordinating solutions: Engaging technical agencies and line ministries in the process of stakeholder engagement early in strategic planning is critical for long-term efficacy and coherence in resilience efforts. Globally, infrastructure investment has taken a traditionally technocratic and top-down approach to identifying needs, defining project scope and siting, and identifying beneficiaries from investment. Often, these methods have also developed quite simplified and limited solutions to complex problems, such as generating energy while hampering or eliminating traditional livelihoods, irreparably damaging critical ecosystems, or adding significant burdens to other sectors such as agriculture or downstream countries. Climate proofing may be limited to risk assessment frameworks (e.g., an SEA or EIA), but realistically these often occur late in project development and remain quite narrow in scope. More recently, water resilience practitioners such as [UNESCO](#) have recommended the use of more inclusive approaches that partner technical decision makers with a **diverse array of stakeholders** early in the project cycle. In one [Thai city](#), for instance, recent emerging sectoral conflicts and climate risks for hydropower, flood control, irrigation water scarcity, and urban resilience were diffused by creating an integrated and conjoined set of urban lakes to solve multiple problems.

The processes of stakeholder engagement expand the set of criteria used to determine project success (e.g., quality of life, ecological resilience) and also reinforce inclusive, equitable growth through such methods as **“shared vision planning.”** The US made this transition with groups such as the US Army Corps of Engineers decades ago and is well placed to facilitate capacity building. Such bottom-up approaches strengthen civil society, transparency, and democratic processes but often require some transition support from more experienced external actors for technical and senior decision makers. Expanding support for initiatives such as the **The Coalition for Disaster Resilient Infrastructure** (CDRI) and its **Infrastructure for Resilient Island States** (IRIS) project or the **USAID and Australia Mekong Safeguards Program** (Mekong Safeguards) is one way to support transparent, locally developed infrastructure investments. Adopting existing tools and frameworks for bottom-up infrastructure development such as the World Bank’s **Decision Tree Framework**, the Asian Development Bank’s recent **water resilience guidance**, or UNESCO’s **Climate Risk Informed Decision Analysis** (CRIDA) may also be beneficial.

4. Finding nature-based solutions: Nature-based solutions, or NBS, should become a new target for investment across the Indo-Pacific, especially for groundwater resources. Groups such as the ADB have recently published a practitioner’s guidance that aligns **NbS with climate resilience**, and in 2022 the ADB has launched a new NbS project preparation and financing facility. Of course, developing regulatory, monitoring, governance, and enforcement systems for groundwater is essential. Some investments should also end, such as donor efforts that have reinforced poor behavior (e.g., **solar-powered groundwater pumps**, which have lowered the costs of groundwater and led to even less sustainable use). In mountainous and snowpack-fed low-elevation areas, dry seasons are generally becoming longer and drier while wet seasons are becoming flashier. A major part of California’s program to move to an “abundance” orientation has been to develop **groundwater recharge systems as regional snowpack storage disappears**; these systems capture rainy-season floodwaters in recharge zones, essentially shifting storage from one nature-based solution (snowpack) to another (aquifers). These approaches

could be transformative in much of southern Asia and, potentially, in island regions as well.

5. Supporting transnational cooperation along rivers: Given the fact that nearly all of Asia's major rivers cross international borders, efforts to strengthen riparian cooperation between countries should be supported. Infrastructure investments upstream, such as hydropower dams, may have significant impact on downstream communities and ecosystems, as is currently being seen in the **Mekong River Delta** and in the lower reaches of the **Kabul River**, a major tributary of the Indus shared by Afghanistan and Pakistan. Similarly, unregulated pumping of transboundary aquifers is becoming a **serious problem** in many Indo-Pacific countries including Pakistan, India, and Vietnam. According to one recent analysis, countries sharing the Ganges-Brahmaputra-Meghna (GBM) basin lose over \$14 billion per year due to poor cooperation amongst the partners. Programs that support the creation and maintenance of transboundary water sharing agreements and technical working groups, such as IUCN's **Building River Dialogue and Governance** (BRIDGE) or the **Mekong-U.S. partnership**, are one way to advance transboundary cooperation.
6. Establish agencies focused on resilience: Following the model of the 100 Resilient Cities (100RC) initiative, consider appointing "chief resilience offices" within the PGII implementation team to ensure that climate risk is mainstreamed into all PGII investments from the start of the project lifecycle. Funding a CRO could enable officials to "own" resilience and direct capacity as well as develop tailored decision making guidelines.

The 2022 U.S.-Indo-Pacific Strategy notes that the United States "has long recognized the Indo-Pacific as vital to our security and prosperity." Investing in climate-resilient water infrastructure is an investment in the long-term economic resilience and stability for the Indo-Pacific region, especially for resilience that reflects broader civil society engagement through shared vision planning. In particular, by investing in water resilience, the U.S. offers a compelling alternative to PRC infrastructure investments under the Belt and Road Initiative, which continues to promote '**technocratic, incremental,**

and industry-oriented approaches to development. The events of the past two years have clearly demonstrated that the challenges facing the region cannot be effectively addressed with incremental change.



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