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This report – a continuation of FIDIC’s State of the World review of the challenges and opportunities associated with water resource management and water security – highlights the importance and interconnected nature of natural and engineered systems and points to some of the innovative solutions required to address the challenges facing the water sector and achieve the Sustainable Development Goals (particularly SDG 6). The insights from this and previous reports in the series underscore a simple but difficult set of truths; globally, the water sector is experiencing unprecedented challenges and pressures and there is an increased urgency to address them with innovative approaches.

Yet there is also reason to be optimistic. There is now a growing – but still not sufficiently realised – appreciation for the value of nature and natural systems in addressing these challenges. Increasingly, opportunities to protect, preserve and enhance aquatic and freshwater ecosystems, sustain livelihoods and meet the nutritional needs of a growing and changing population, will likely drive new financing and investment, enhance governance strategies for managing shared resources and bring new technologies to arrest and reverse the loss of nature and build a carbon-neutral and nature-positive economy and society.

Climate change, overuse of freshwater resources and changing consumption patterns are just a few of the myriad forces putting freshwater systems increasingly at risk. The past 20 years have seen the quickest rise in the earth's temperature since records began in 1880 and the consequences for the global water system are clear. The 2020 global Living Planet Report – WWF's landmark review which presents a comprehensive overview of the state of our natural world through the Living Planet Index – clearly outlines how humanity's increasing destruction of nature is having catastrophic impacts not only on wildlife populations but also on human health and all aspects of our lives. Serious declines in species population numbers are a measure of overall ecosystem health and the index suggests, simply, that we're fast approaching a tipping point. Consumption of freshwater is increasing by 1% per year in line with a growing population and the associated demands that correspond with a welcomed rise in living standards. There is an associated decline in the Living Planet Index for freshwater species of 4% per year, meaning that freshwater biodiversity is more imperiled than the terrestrial biome. In the 20th century, around two-thirds of all the world's remaining wetlands were drained, dammed and dyked and they are still disappearing three times faster than rainforests. The bottom line: despite the importance of water for life and health, with natural systems playing an essential role in freshwater regulation, these ecosystems have become threatened. Their disruption and destruction is costly and in many ways harms human health. Protecting freshwater cannot happen alone and will require new forms of collaboration between the public and private sectors and new tools and strategies.

Against this backdrop, WWF has developed an emergency recovery plan for freshwater; a six-point plan that prioritises solutions that are rooted in cutting edge science and have already proven successful in certain locations: letting rivers flow more naturally, reducing pollution, protecting critical wetland habitats, ending overfishing and unsustainable sand mining in rivers and lakes, controlling invasive species and safeguarding and restoring river connectivity through better planning of dams and other infrastructure. The engineering and conservation communities are well positioned today to work together on three facets of this plan: promoting nature-based solutions, engaging in better planning practices and bridging the financing gap.

1. **Nature-based solutions.** Nature can provide many of the solutions we need - from healthier floodplains that help prevent flooding of cities, mangroves that protect coastal communities from storm surges and wetlands that improve water quality. Nature-based solutions (NBS) are actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human wellbeing and biodiversity benefits. They are underpinned by benefits that flow from healthy ecosystems and target major challenges like climate change, disaster risk reduction, food and water security, health and are critical to economic development. NBS can also substitute for, or complement, more traditional engineered solutions. Engineered solutions generally provide a single benefit and often influence other resources and require continued maintenance and eventual replacement. In contrast, NBS provide the primary benefit and a range of co-benefits and often require less maintenance over time as they rely on the regenerative processes of nature. For example, levees and floodwalls provide a single benefit, impact river-floodplain ecosystems and require considerable long-term maintenance (much of the developed world now faces a considerable challenge of backlogged maintenance of levees). In contrast, NBS for flood management can reduce flood risk while benefiting water quality, nutrient sequestration, biodiversity and open space and require less maintenance over time.
2. **Integrated approach to planning.** The conservation and engineering communities - together with national and subnational governments and other sector stakeholders - can rethink and reshape the way infrastructure is designed and infrastructure services are delivered. Governments must continue to invest in institutions, infrastructure and information systems across sectors and link national planning to local decision-making. Such investments help satisfy often competing environmental, economic and social needs while preparing for the future. Planning at the system-scale can support more sustainable development options or pathways by quantifying how a group of projects perform as a system, examining the tradeoffs that are inherent in infrastructure development and selecting options that minimize harm and optimise benefits. More equitable and transparent regulations and allocations, a mix of natural and hard infrastructure and increased monitoring and data can all further help reduce delays and cost overruns due to projects with high social or environmental conflicts or risks, improve climate resiliency and reduce the risk of 'economic water shortage', the term applied when poor management or a lack of investment keeps a population from accessing an adequate water source.
3. **Developing a pipeline of bankable water projects.** Finally, the conservation, engineering and finance communities together can structure sustainable water projects and direct investments into priority landscapes and basins, moving beyond a project-based approach to water-related investment. With a better understanding of water risk and how to account for it when valuing investments, these entities can proactively engage with existing efforts and start to create offerings that finance NBS and support policy that lays the foundation for credible green investments.

