



Source of the Dongjiang © Zengqingsong

EXECUTIVE SUMMARY

Dongjiang Basin, China:

An assessment of freshwater ecosystem health

The Dongjiang is the primary water source for more than 40 million people in southern China. Despite its relatively small size, the basin is facing multiple — and often conflicting — freshwater needs. In the late 1950s, dams were built to provide flood control and hydropower, but currently water allocation and water quality have emerged as top priorities. Socioeconomically, there is a substantial disparity between rural upstream communities and urban areas in the delta, where per capita GDP is at least 10 times greater. This provides an impetus to relocate industries further upstream and maximize the productive use of land, both of which would bring short-term economic development but threaten water-related ecosystem services, such as the availability and quality of water downstream.

To help decision-makers assess trade-offs and set priorities for the Dongjiang's future, a consortium led by Conservation International and IUCN applied the Freshwater Health Index, a pioneering tool for assessing basin health in three components: ecosystems, water services and governance. Working with partners from Sun Yat-sen University, South China University of Technology and the Pearl River Water Resource Commission, a team of experts measured 11 key indicators, with 25 sub-indicators, scaled from 0-100 for ease of interpretation. Stakeholders from national, provincial and local governments as well as industry, academia and civil society provided input and helped identify top priorities. This is the first ever comprehensive look at freshwater health in the Dongjiang basin, and it provides several insights for further analysis or possible policy action.

KEY RESULTS

- The Governance & Stakeholders component, which received the lowest score (56), should be treated as a priority within the basin. Strengthening underlying governance issues is a critical first step as decision-makers work to meet increasing water demand, improve water quality and adapt to climate change impacts.
- Ecosystem Vitality received a score of 60, indicating moderate health for land, waterways and aquatic life. As the basin is heavily urbanized and has already been altered (e.g., through the construction of dams and reservoirs), there is likely a limit to how much this score can improve. Instead, focus should be on making targeted improvements and ensuring that the score does not decline.



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September 2017

- Ecosystem Services received the highest overall score (82) of the three components, indicating that the basin is presently meeting stakeholders' needs quite well. Water provisioning, rated most important among stakeholders, scored highest, whereas services that reduce hazards (such as floods) and maintain water quality scored more moderately.
- Pressures on the basin's ecosystems include flow and channel modification, which are primarily disruptive to fish and other aquatic life. But local declines in water quality, particularly from municipal wastewater and urban runoff, threaten both aquatic life and water supply. The lowest score for Water Quality Regulation was recorded at the downstream station of Boluo.
- Land cover is presently in moderate health (75), but lower scores in the upstream area south of the Fengshuba Reservoir reflect additional pressure from agricultural runoff. Similarly, Sediment Regulation scored 73, and although stakeholders do not perceive it as a major concern, areas above the Xinfengjiang and Baipenzhu reservoirs scored lower, which indicates threatened water quality and possibly the capacity of the reservoirs.
- Enforcement & Compliance received the highest score (60) in the Governance & Stakeholders component, but this was offset by a low score for Water-related Conflict (48), which was identified as the major concern. Incentives & Regulations also received a low score (47), which could be improved by incorporating additional tools such as eco-compensation for watershed services, which is already under consideration.

CONCLUSIONS & NEXT STEPS

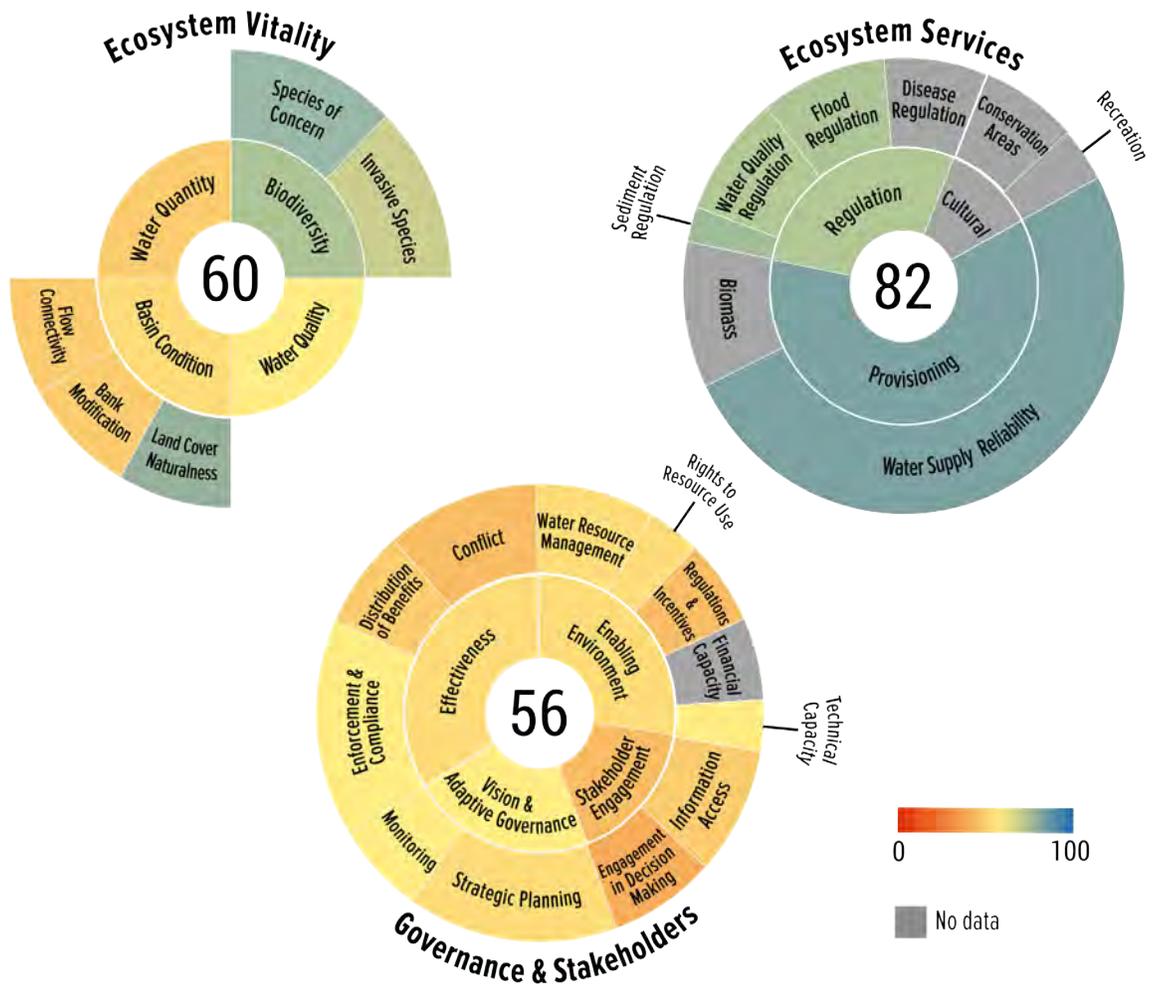
Overall, the Dongjiang basin is currently meeting the needs of the population that depends on it, as reflected in the high score for Ecosystem Services. The lower score for Ecosystem Vitality indicates that human needs are being met at the expense of the local ecology, which may constitute an acceptable trade-off, but may also be an area where residents demand improvements in the future. **Responding to changing demands as well as a changing climate will be challenging, however, given the current governance system.** Increasing concerns about water quality near municipal intake points is just one example of where quantity and quality monitoring should be more integrated. This information should be made more accessible to stakeholders, and forums for local and cross-province engagement should be encouraged.

To stay on top of these issues and monitor progress **we recommend re-assessing freshwater health in the basin within three years.** Local partners, including Sun Yat-sen University, South China University of Technology and the Pearl River Hydraulic Research Institute, are now familiar with the methods and are capable of leading future assessments. Stakeholder groups who participated in this first assessment through the workshops should continue to be engaged and provide feedback, but also be expanded to include even more participation from local government and industry.

We identified a few data gaps that should be addressed prior to a subsequent assessment. Although groundwater is not a substantial source in the basin, the overall picture is not complete without better data on its availability, use and quality. Despite the Dongjiang basin not being as biologically rich as the other parts of the Pearl River, local

monitoring of biodiversity would be useful to prevent additional species loss. And given the importance of improving water governance in the basin, **it will be useful to identify financial needs, in terms of the gap between proposed budgets and actual allocations in water resource management sectors.**

Stakeholders in the Dongjiang expressed a strong interest in exploring future changes via scenarios. These scenarios include future economic development — increased urbanization and industrial relocation to upstream areas of Huizhou and Heyuan — as well as climate change, which may create more frequent extreme events (e.g., floods and droughts) in the basin. Thus, **an immediate next step would be to develop detailed scenarios with stakeholders and model these scenarios to evaluate changes** in specific Ecosystem Vitality and Ecosystem Services indicators. This will help stakeholders identify undesirable trade-offs and possible synergies, and help them begin setting quantitative targets for safeguarding the Dongjiang’s health.





We would like to thank all of the participants in our stakeholder forums for their time and insightful feedback in this testbed application of the Freshwater Health Index. Researchers from Sun Yat-sen University, South China University of Technology and the Pearl River Hydraulic Research Institute contributed their expertise and data to calculate many of the indicators and validate results. IUCN's South China program office capably coordinated these institutions and marshaled dozens of energetic volunteers to assist at both forums as well.

We would also like to acknowledge the contributions of our Science Working Group (www.freshwaterhealthindex.org/science-working-group), which provided the initial conceptual and technical guidance to develop the Freshwater Health Index.

Finally, we are immensely grateful to our dedicated financial supporters, without whom we could not have realized the success of the Freshwater Health Index. Thank you to the Victor and William Fung Foundation Limited, Borrego Foundation, Flora Family Foundation, Betty and Gordon Moore, and Starwood Foundation.

