



CHISHUI RIVER BASIN

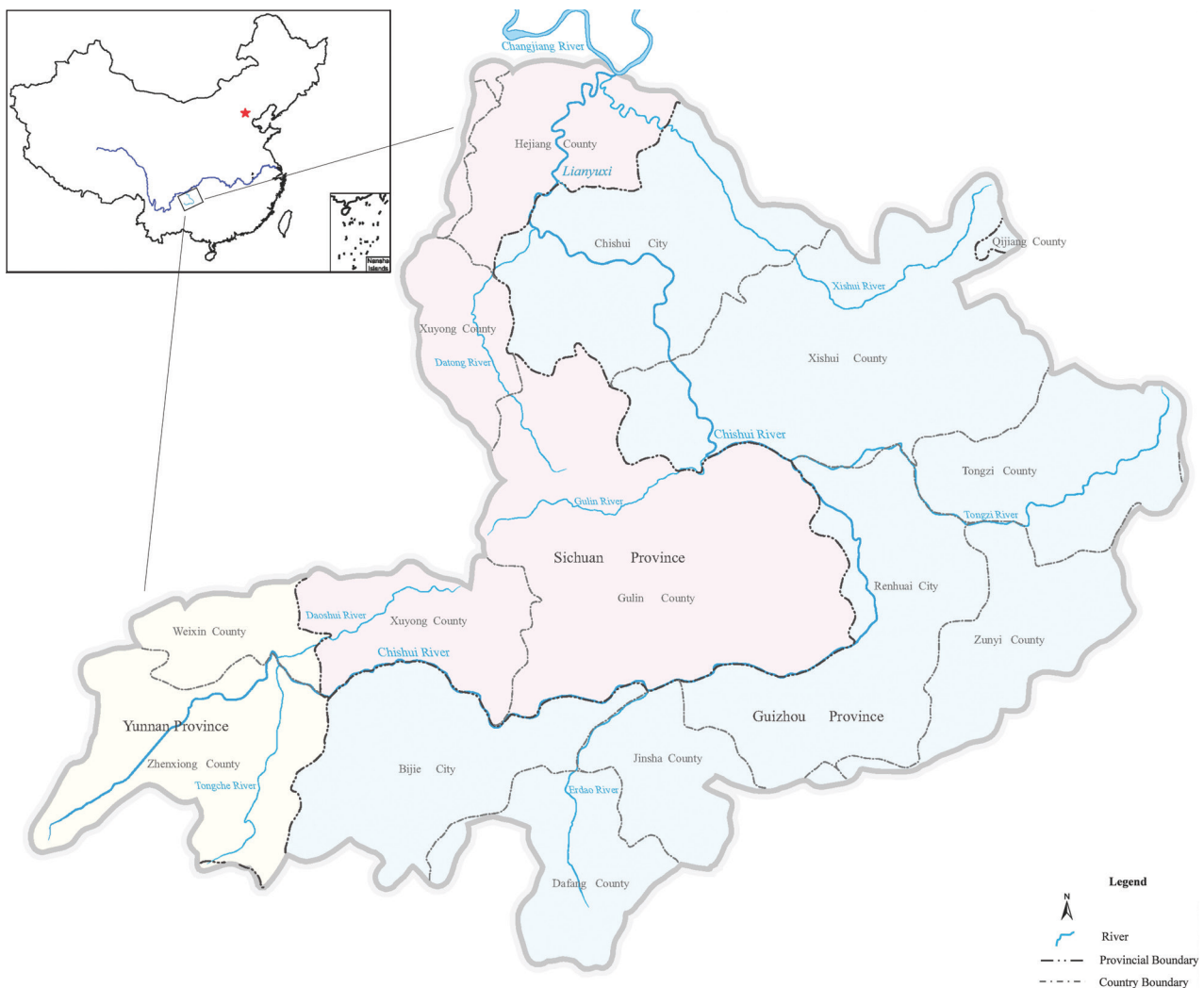
2019
REPORT CARD
CHINA

CHISHUI RIVER BASIN: A UNIQUE SYSTEM

Chishui River is a major tributary of upper Changjiang River. Its name literally means “red water river” because it shows reddish color in lower stream due to a large sediment concentration. It derived in Yunnan Province, forming partly the boundary between Guizhou Province and Sichuan Province and flows into Changjiang River in Sichuan Province. It is sometimes called the River of Wines since there are several types of famous Chinese wines, including Lang Wine, Xi Wine and Maotai, originated along the river. It is also known as the field of a major battle commanded by Mao Zedong in 1935 during the Long March of Red Army.

An important tributary of the Changjiang, the Chishui remains the only tributary without a mainstream dam. Surrounded by virgin forests in a sub-tropic area, the Chishui is a refuge for endemic fish. It's natural beauty and clean waters are critical to people and nature in the three provinces it crosses, among the poorest in the country.

The Chishui River Basin stretches over 400km, providing cultural and ecological importance with each turn. Over 10 million people rely on the Chishui, benefiting from its health and unrestricted flows.



The Chishui River flows north the south throgh three Provinces before reaching the Changjiang River.

DEVELOPING THE CHISHUI RIVER REPORT CARD

River basin report cards are assessment and communication products that compare ecological, social, and/or economic information against predefined goals or objectives.

Similar to school report cards, river basin report cards provide performance-driven numeric grades or letters that reflect the status of a river basin on a regular basis. They effectively integrate and synthesize large, and often complex, information into simple scores that can be communicated to decision-makers and the general public.

Report cards have been shown to be a powerful instrument to describe ecosystem status, increase public awareness, and inform and influence decision-makers to take action to improve or maintain the health of a river basin.

The process of developing report cards is highly participatory and includes the following five steps: i) identification of values and threats, ii) selection of indicators, iii) definition of thresholds, iv) calculation of scores, and v) communication of results.

The Chishui River Basin Report Card was developed by Changjiang River Water Resource Commission and Asian Development Bank.

The Chishui River Report Card was created through a series of stakeholder workshops with representatives of Chinese government agencies, academic institutions, NGO representatives, and the private sector. During the stakeholder workshops, many indicators were selected to be included in the report card. After compiling the best available data, 16 indicators were assessed by comparing each indicator with its threshold and designating a report card grade.

At this stage, annual data from only one site has been used to assess the health of the Chishui River. It is expected that as more monitoring data and sampling locations are developed, this report card can expand.

The Chishui River Report Card represents the first of its kind for the basin and can be updated and improved as needed to best represent the status of the basin.

This first report card will serve as baseline to measure change in the future in response to management actions, inform policy and planning within the basin.



INDICATORS AND THRESHOLDS OF CHISHUI RIVER HEALTH

Category	Indicators	Excellent	Good	Moderate	Poor	Value for Lianyuxi*
Water resource protection	Water level (m)	≥ 224	223.8 – 224	223.6 – 223.8	≤ 223.6	223.8
	Flow (m ³ /s)	≥ 300	200 – 300	100 – 200	≤ 100	197.74
Water environment improvement	COD _{Mn} , permanganate Index (mg/L)	≤ 2.0	2.0 – 4.0	4.0 – 6.0	≥ 10.0	2.20
	COD _{Mn} , permanganate Index (t/y)	≤ 13837.87	13837.87 – 20756.81	20756.81 – 41513.62	≥ 41513.62	12316.06
	NH ₄ -N, ammonia nitrogen (mg/L)	≤ 0.15	0.15 – 0.5	0.5 – 1.0	≥ 1.5	0.46
	NH ₄ -N, ammonia nitrogen (t/y)	≤ 1037.84	1037.84 – 2248.65	2248.65 – 6918.14	≥ 6918.14	677.12
	TP, total phosphorus (mg/L)	≤ 0.02	0.02 – 0.1	0.1 – 0.2	≥ 0.3	0.06
	TP, total phosphorus (t/y)	≤ 138.38	138.38 – 415.14	415.14 – 1383.79	≥ 1383.79	221.72
River ecology restoration	Suspend sediment (mg/m ³)	≤ 500	500 – 750	750 – 1000	≥ 1000	18.6
	Ecological flow (m ³ /s)	≥ 118	59 – 118	47.2 – 59	≤ 47.2	95.74
	Zoobenthos index	≥ 2.0	2.0 – 1.5	1.5 – 0.5	≤ 0.5	1.07
	phytoplankton index	≥ 1.5	1.5 – 1.0	1.0 – 0.5	≤ 0.5	0.90
	Fish index	≥ 0.8	0.5 – 0.8	0.3 – 0.5	≤ 0.2	0.75
Water surface and shoreline management	Floating debris area (m ²)	≤ 5	5 – 15	15 – 20	≥ 20	<5
Water governance	Local government response to river chiefs (%)	≥ 85	75-85	65-75	≤ 65	92
	Satisfaction rate of Changjiang Water Resource Commission (%)	≥ 85	75-85	65-75	≤ 65	90

* Note: Lianyuxi is the trans-provincial section selected to evaluate the performance of applying river chief system in Chishui River

INDICATOR DESCRIPTIONS

Water level and flow: annual average values obtained from the Chishui Hydrological Station, which is near the Lianyuxi Section.

COD_{Mn}, NH₄-N and TP: priority controlled pollutants, which use the concentrations and flux (concentration multiply by flow) to assess, and the concentration data use the annual average values obtained at the Lianyuxi National Water Quality Monitoring Station.

Suspended sediment: yearly averaged value obtained from the Chishui Hydrological Station.

Ecological flow: adopted the limiting values of the Chishui River.

Zoobenthos index, phytoplankton index and fish index obtained from the unpublished river ecology field survey results in recent years.

Floating debris area: reflect water surface cleanliness, and garbage dump in the riparian zone. Value of this indicator referred experience in other province in the Changjiang River Basin.

Local government response to river chiefs, and Satisfaction rate of CWRC: these two indicators evaluate the satisfaction rate of local government and basin management agency to application of the river chief systems.

All the indicators were categorized into four class (excellent, good, moderate and poor) according to data, experts experiences and related standards.

STATUS OF THE CHISHUI RIVER



OVERALL, THE CHISHUI RIVER IS IN GOOD CONDITION

1. Due to limited resources, this report card mainly consider one trans-provincial section (or short river reaches) as a pilot demonstration, it is recommended to evaluate the whole river mainstream and major tributaries, and covering all the trans-boundary sections;
2. Hydrology, water quality and aquatic organisms were not measured in the same stations (sites) and period, it is necessary to establish the comprehensive river health monitoring stations, and increase the representativeness of the data.
3. Fully application of the river chief system just started at the end of the 2016, and most of work concentrated on establish the river chief offices, draft regulations and "one river one policy", the effectiveness can not promptly reflected in improvement of water quality and ecology. So long term monitoring and evaluating needed to identify the contribution of river chief system to basin eco-environment protection.
4. This report card aims to the monitoring and evaluating the trans-provincial sections, which may enhanced the coordination among provinces and basin management agency based on trans-provincial monitoring and evaluation in the context of the river chief system.

RIVER CHIEF SYSTEM OF RIVER MANAGEMENT

The river chief system is an important innovation for river and lake protection, and management in China. River chiefs are required to lead and coordinate water related government departments to solve the most urgent pollution problems and management shortcomings, and hence can fully utilize local administrative, financial and human resources. There are four levels of river chiefs: i) provincial, ii) urban, iii) county, and iv) township, in descending order of power.

River chiefs have the following major six tasks:

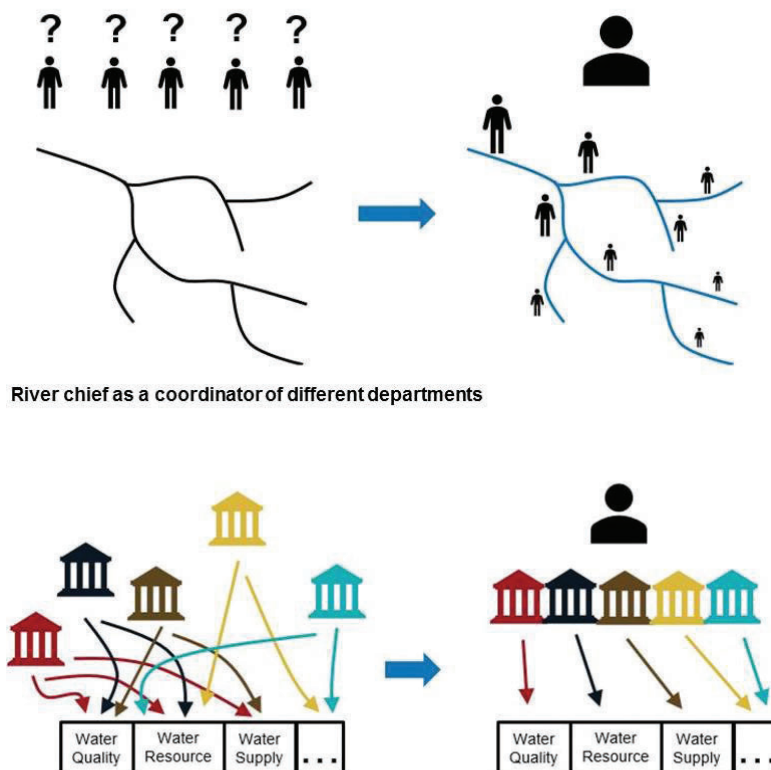
1. water resource protection
2. water pollution control,
3. water environment improvement,
4. river ecology restoration,
5. water and shoreline management, and
6. water governance.

Performance as a river chief is important for the overall assessment of officials. Assessment criteria for river chief systems is set up greatly depending on local river/lake water quality in the current period. This promotes accountability for environmental performance in their jurisdiction, beyond traditional measures of "GDP only" growth at the expense of the environment.

River chiefs are held accountable through public supervision. River chiefs are published including a list of responsibilities, the current condition of the corresponding river/lake and a supervision telephone number.

Apart from ensuring regular river/lake management and protection, the responsibility of river chiefs also includes coordination on trans-jurisdiction issues. Most rivers in China are trans-boundary rivers, and flow through different administrative regions. The Chishui River, for example, traverses and is bounded on either side by several provinces. Rivers require management at the basin scale, rather than at the provincial scale. With the cooperation of river chiefs, conflicts between different regions/departments can be solved more effectively. The Changjiang River Water Resource Commission (CWRC) is responsible for the "guidance, coordination, monitoring and supervision" of the river chief system application. Trans-provincial river monitoring and evaluation by a basin management agency (such as the CWRC) can guide, supervise and coordinate local governments, to realize a actual "one river one policy".

The River Chief Mechanism



Source: China Water Risk
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Conceptual diagram of the river chief system instituted throughout China. Source: China Water Risk

RECOMMENDATIONS

Recommendations to improve the current health of the Chishui River are:

1. Reduce the water and soil loss from the upstream region, control the rural non-point source pollution and decrease the fertilizer application, and improve the rural domestic wastewater treatment capacity.
2. Rectification of small hydropower stations in the tributaries of the Chishui River, restore the ecological connectivity between mainstream and tributaries, and then protect the rare migration fishes.
3. Improving eco-environment monitoring stations or sites, carrying out the comprehensive monitoring for hydrology, water quality and aquatic organisms, formulate the uniform monitoring indicators and methodologies for trans-provincial sections, promote the eco-environment monitoring information share at the basin level.
4. Enhance the level of trans-provincial coordination and joint protection among the Yunnan, Sichuan and Guizhou Province, implement the task and requirement of the basin eco-environment protection plan, strengthen the joint prevention and control of pollution, and law enforcement in the whole basin.
5. Positively develop the ecological industries and products, such as ecological tourism and water resources scenic spots, promote the combination between application of river chief system and poverty alleviation, balance the eco-environment protection and economic development, promote the national pilot for basin ecological compensation.
6. Encourage the public participation, cultivate the environment protection volunteers, and civilian river chiefs.



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ASIAN DEVELOPMENT BANK



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