

Analysis of Water Resources Evolution and Comprehensive Management Countermeasures in Arid Zone of Longchuan River Basin in Central Yunnan

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Abstract

The Longchuan River is a tributary of the Jinsha River in the middle of the Yangtze River basin and known as the “Mother River” of Chuxiong Prefecture, which has also been selected as an excellent case of “Beautiful River and Lakes” by the Ministry of Ecology and Environment. The whole basin is located in Chuxiong Prefecture and is subject to human activities, with a high degree of water resources development and utilization. The water resources, water environment, water ecology and water disasters are highly representative of the southwest region, and the evolution of water resources in the Longchuan River basin has attracted wide attention from all walks of life. The study focuses on the analysis of water resources evolution, ecological flow guarantee, river water quality, aquatic life conditions and other aspects through the detailed hydrological monitoring data collected in the Longchuan River basin. There are five aspects of the problem: 1) transformation of “governance of the township, county and industry” to “governance of the basin and joint governance of the whole area” has not been implemented. 2) Weak urban and rural sewage treatment facilities lead to low sewage treatment rate. 3) Combination of protection governance and orderly development has not been achieved in industrial development. 4) High degree of water resources development and utilization in the basin. 5) Comprehensive governance by government, enterprises, the masses and individuals, and group policies still need to be strengthened. This paper puts forward rationalized suggestions for integrated watershed management in five aspects, which are of great significance for the protection of watershed, and also have reference significance for integrated watershed management in the southwest region.

Key words

Management countermeasure; current situation analysis; water resources evolution; Longchuan River basin; Chuxiong Prefecture

Overview of Longchuan River Basin

Longchuan River is located in the transition zone between Hengduan Mountain Range and Yunnan-Guizhou Plateau. It is an important river flowing through the central area of Chuxiong Prefecture. Its geographical position is between 100° 56' ~ 102° 05' east longitude and 24° 50' ~ 26° 15' north latitude. East of the provincial capital Kunming, north of Sichuan Panzhihua City, Liangshan Yi Autonomous prefecture, west of Dali Bai Autonomous Prefecture, Lijiang City.

The Longchuan River is a first-level tributary of the south bank of the Jinsha River, with abundant water sources. It originates in Wujie Town, Nanhua County, Chuxiong Yi Autonomous Prefecture, flows from west to east through Nanhua County and Chuxiong City, then turns north into Lufeng City and Yuanmou County, crosses Yuanmou District, and finally joins the Jinsha River in Jiangbian Township, north of Yuanmou. The river system of Longchuan River basin is more developed, and the left bank is more developed than the right bank. The upper part of the main stream into the tributaries are mainly Shuangdian River, West Jing River, Zidian River, etc. the middle part of the tributaries into the main Guangtong River, Mousing River (also Longchuan River), Yanchai River, Yibi River, Yangjie River, Xiangxiang River and Old City River, etc. the lower part of the tributaries into the main Linghe River and Menggang River (also known as Puteng River)

Existing problem

1. The transformation of the governance of the township, county and industry to the governance of the watershed and the joint governance of the whole region is not in place.
2. The weak urban and rural sewage treatment facilities lead to low sewage treatment rate.
3. The industrial development in the basin has not realized the combination of protection and management and orderly development.
4. The basin water resources development and utilization degree is high.
5. Comprehensive governance by the government, enterprises, the masses and individuals, and collective governance still need to be strengthened.

Basin comprehensive management measures

1. Adhere to planning and guidance, and strengthen all-region joint governance.
2. Adhere to joint management and gather a strong synergy of the whole basin governance.
3. Adhere to the importance of industry and promote the upgrading of industrial structure in the basin. In order to
4. Create a pastoral complex to achieve systematic protection.
5. Uphold mass prevention and treatment, and build a new pattern of joint contribution and shared benefits.
6. Adhere to the red line of water resources management and strengthen ecological flow protection.
7. Build digital twin basins and improve the level of information management in basins.