Greening Mines and Revitalizing Cultural Tourism[1]

Ecological Restoration and Transition at Abandoned Mines in Shizuishan, Ningxia

Abstract: Mining areas in arid and semi-arid northwestern China face fragile ecosystems and little margin for error in ecological restoration. Ecological degradation resulting from decades of intensive mineral extraction makes it particularly challenging to reconcile ecological restoration with regional transition. The abandoned mines of Shitanjing in Shizuishan, Ningxia, exemplify these challenges. Through systematic measures, including slope regrading and bench lowering, backfilling with mining waste, soil improvement, and revegetation, local environmental conditions have been significantly improved. Building on these restoration efforts, Shitanjing has developed an integrated approach that combines ecological restoration, commercial tree and fruit cultivation, cultural tourism, and film production. Restored slopes now support Hongmei apricot orchards and other commercial plantings, while the area's well-preserved industrial and mining heritage has provided the foundation for the development of a town centered industrial heritage tourism and film production. The town has hosted more than 40 film and television productions and received China's AAA-rated tourist attraction designation in 2025. Shitanjing's transformation from a coal-mining town to a restored ecological landscape and, subsequently, a tourism and film town offers a practical example of green transition in resource-depleted mining areas.

Keywords: ecological restoration of mines; industrial transition; tourism and film town; resource-depleted mining areas

I. Background

China possesses substantial mineral resources, but decades of intensive extraction have left numerous abandoned mines and severe ecological degradation, including damaged hillsides, soil degradation, and legacy pollution. Natural conditions vary considerably across regions. Eastern China generally benefits from more favorable moisture and temperature conditions, providing a relatively strong foundation for ecological restoration. By contrast, mining areas in arid and semi-arid northwestern China face water scarcity, thin soils, and frequent wind erosion. These constraints leave little margin for error in ecosystem reconstruction and make vegetation establishment and long-term maintenance challenging. Reconciling ecological restoration with regional transition has therefore become a major challenge in China's efforts to rehabilitate abandoned mines.

The Shitanjing mining area in Shizuishan, Ningxia, provides a representative example of mine restoration in arid northwestern China. Covering 356 square kilometers, it lies in the core ecological protection zone of the northern Helan Mountains. Historically, it was a major production center for China's high-quality Taixi coal, with annual output reaching 7.3 million metric tons at its peak. It was widely known as the "100-li mining belt" Of the Helan Mountain. More than 50 years of intensive coal mining resulted in collapsed and exposed hillsides, coal-dust dispersal, and wastewater accumulation in abandoned mine pits, while widespread destruction of native vegetation. Combined with low rainfall, loose geological conditions, and infertile saline-alkaline soils, these impacts led to severe slope

[1] Case provided by CCICED Special Policy Study on *Green and Just Transitions Pathways for Traditional Energy Regions*

instability and soil erosion. The area's capacity to control wind erosion, stabilize sand, and retain water was largely lost. Compared with mining areas in eastern China, retaining water, improving soil stability, and restoring vegetation are more considerably difficult in Shitanjing, with very little margin for error. As a result, Shitanjing is consequently a priority area and one of the most challenging sites for ecological restoration in the Helan Mountains.



Figure 1. Selected project sites before and after restoration (post-restoration images taken in 2025)
(Image source: Ningxia Hui Autonomous Region Bulletin on Territorial Spatial Ecological Conservation and Restoration 2025)

II. Key Measures

(1) Implementing systematic mine ecological restoration

The ecological restoration project for Shitanjing's abandoned legacy mines began in November 2024 and was completed by the end of 2025, restoring a total of 227.62 hectares. Restoration activities followed an integrated approach involving slope regrading and bench lowering, backfilling with mining waste, soil capping, and revegetation. The work included 50,000 cubic meters of slope stabilization, 170,000 cubic meters of soil improvement, and the planting of more than 20,000 saplings. Restoration measures were tailored to local site conditions, combining saplings planted in individual pits with broadcast grass seeding to restore ground cover. Drought-tolerant native plants capable of growing in poor soils, including tamarisk, peashrub, and Mongolian wheatgrass, were prioritized for the comprehensive rehabilitation of degraded hillsides. To address local aridity and water scarcity, drip irrigation and other water-supply facilities were installed throughout the project area to improve long-term vegetation survival. These systematic measures restored degraded hillsides and substantially improved ecological conditions across the former mining area.



Figure 2. Panoramic view of Shitanjing

(Image source: People's Daily Online[2])

(2) Integrating ecological restoration with commercial tree and fruit cultivation

Local authorities moved beyond a restoration-only approach by integrating ecological rehabilitation with productive land use and long-term industrial development. Since 2017, contiguous Hongmei apricot orchards have been established in restored areas such as Dadenggou and Gannigou. After years of cultivation, the trees now bear fruit regularly. In early summer 2026, the orchards had lush foliage and the season's first fruit was beginning to develop. Hongmei apricots are well adapted to the dry climate and thin, infertile soils of the Helan Mountains, providing both soil stabilization and commercial returns. This approach restores the ecological functions and agricultural productivity of degraded land, expands opportunities for stable income growth among local residents, and converts environmental improvements into tangible livelihood benefits.



Figure 3. Thriving Hongmei apricot orchards in Dadenggou and Gannigou, Shitanjing, following ecological restoration

(Image source: Guanzhu Senlin[3])

(3) Transforming abandoned industrial and mining sites into a tourism and film town

Shitanjing's well-preserved industrial and mining buildings from the 1960s to the 1990s form an intact former industrial and mining administrative district. As a rare heritage site in China and one of the most distinctive sites in Ningxia, the area provides a unique foundation for redevelopment Building on these assets, the town has pursued integrated development strategy, combining industrial heritage tourism, film and television production, and sporting events. The Shitanjing Industrial Heritage, Tourism and Film Town has hosted more than 40 productions, including Welcome to the Chinese Restaurant, Minning Town, Home Coming, and Flames in the Wind. Four measures have supported this development. First, vacant industrial and mining assets have been repurposed to provide accommodation, dining facilities, and props storage. Second, a local actors' guild has been established, arranging a cumulative 13,000 engagements for extras and providing comprehensive support services. Third, applications for national support for independent industrial and mining areas enable access to central government budget funding for the transition and development of resource-based regions. Fourth, cooperation with the Beijing Film Academy has been strengthened through a joint development agreement, leading to the establishment of its Shitanjing Film and Television Production Practice Base in 2024.

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[2] People's Daily Online. Shitanjing, Ningxia: An old mining area becomes a film town [online]. (2025-01-18) [accessed 2026-09-16]. http://nx.people.com.cn/n2/2025/0118/c192150-41112880.html.

[3] Ningxia Daily. Beautiful Ningxia, a journey through its oases: A mountain's scars and transformation through restoration [online]. (2024-07-30) [accessed 2026-09-16]. http://www.isenlin.cn/sf_A3C62B7323EB47EFA46289E25C3D2A86_209_6F93FBF8930.html.



Figure 4. Streetscape of the Shitanjing Industrial Heritage, Tourism and Film Town, whose twentieth-century mining architecture attracts film crews

(Image sources: Sohu[4] and Feeker Travel[5])

(4) Integrating film production with cultural tourism and sports

The town has developed distinctive ecological and industrial heritage tourism routes linking the green-liveried No. 7524 mining-area commuter and sightseeing train, industrial heritage sites, restored landscapes in the Helan Mountains, former military sites, and filming locations. It regularly hosts cultural and sporting activities, including the Sounds of Industry Music Festival, industrial heritage photography competitions, the Helan Mountains Shitanjing Grand Canyon Off-Road Motor Rally, mountain biking races, and hiking activites. The town has also developed immersive visitor experiences including dining inspired by the planned-economy era, industrial-themed specialty drinks, hotpot restaurants in mountain caves, and mountain stargazing campsites. Together, these offerings support a visitor economy combining daytime sightseeing with evening leisure. In 2025, the Shitanjing Industrial Heritage, Tourism and Film Town received China's AAA-rated tourist attraction designation, welcomed 170,000 visitors, and generated total tourism revenue of RMB 700,000.

(5) Combining cost control and carbon reduction with environmental improvements and higher employment and incomes

First, restoration costs are managed efficiently. Mining waste is reused locally as backfill material, reducing the need to purchase soil, while surplus soil from municipal works is used for soil

[4] Ningxia Tourism. Celebrating May Day in Ningxia in 2025: Explore the Shitanjing Industrial Heritage, Tourism and Film Town through the film Trapped [online]. (2025-04-29) [accessed 2026-09-16]. https://travel.sohu.com/a/890344035_121106869.

[5] Feekr Travel. Neither Yinchuan nor Zhongwei: The filming location of Welcome to the Chinese Restaurant is a little-known city in Ningxia [online]. (2026-08-24) [accessed 2026-09-16]. https://mp.weixin.qq.com/s/y25cnCEqCFDs2ZT__MHitw.

improvement. These practices substantially lower the costs of transporting excavated material off-site and purchasing new soil. In addition, the use of drought-tolerant native vegetation also reduces subsequent irrigation and maintenance requirements. Together, these ecologically informed engineering measures lower long-term management expenses and support affordable, sustainable restoration.

Second, ecological carbon sequestration and pollution control have produced substantial benefits. Large-scale revegetation has established a combined vegetation and soil carbon pool, steadily increasing the mining area's carbon sequestration capacity. Coal dust pollution and surface wastewater problems have been effectively eliminated throughout the area, and wildlife species, such as blue sheep, have returned to the area. Soil erosion and windblown sand and dust have been greatly reduced, while the capacity of the northern Helan Mountains to reduce wind erosion and stabilize sand is steadily recovering.

Third, diverse activities create sustained employment opportunities. Fruit cultivation, woodland maintenance, tourist attraction operations, film production support, and event services have generated a wide range of jobs for local residents. Extras can earn up to RMB 6,000 per month. Laid-off miners and residents of surrounding villages have able to transition into new local jobs, providing a pathway for a smooth workforce transition in resource-depleted mining areas and strengthening the livelihood foundations of a just transition in the coal-dependent regions.

III. Lessons Learned

By combining systematic ecological restoration with the productive reuse of local resources, the Shitanjing model has developed an integrated transition pathway linking restoration with new industries. It coordinates environmental rehabilitation, the reuse of idle assets, and industrial restructuring, offering practical lessons for a green and just transition in traditional energy regions.

(1) Coordinating multiple stakeholders and targeting dedicated funding

Shitanjing's abandoned-mine restoration and transition efforts have delivered substantial results through comprehensive, landscape-scale rehabilitation within the broader ecological protection framework for the Helan Mountains[6]. The project draws on dedicated central government funding for demonstration projects to restore legacy mines and for the transition of independent industrial and mining areas, complemented by Ningxia's overarching planning and various dedicated funding programs. Enterprises, including CHN Energy Ningxia Coal Industry Co., Ltd., have fulfilled their primary responsibilities for mine rehabilitation. Professional cultural tourism operators have been introduced to revitalize industrial and mining heritage, while renewable energy companies have developed solar power plants on restored land, with land-use revenues reinvested in ecological maintenance. This government-enterprise collaboration approach has attracted private investment and fostered successor industries. Area-wide coordination and measures tailored to individual zones have strengthened the arrangements for maintaining restoration outcomes over the long term.

(2) Applying science-based revegetation and adapting heritage reuse to local conditions

Science-based revegetation prioritizes drought-tolerant native plants adapted to local environmental conditions to improve survival rates, alongside commercial tree and fruit cultivation that combines ecological recovery with income growth. The distinctive character of the intact

[6] The Helan Mountains form an important ecological security barrier in northwestern China. Located at a key junction between the Yellow River's priority ecological zone and the northern sand-control belt, they help safeguard ecological security in northwestern and northern China.

industrial and mining buildings has also been used to create ready-made filming locations. By turning industrial heritage into a central asset for cultural tourism, the town has effectively translated environmental improvements into tangible livelihood benefits.

(3) Using existing resources to develop successor industries and support employment transitions

Shitanjing's experience goes beyond ecological rehabilitation alone, integrating systematic restoration with the productive reuse of local resources. Revegetation adapted to the area's arid conditions combines ecological protection with economic returns, while industrial and mining heritage supports cultural tourism, film production, and sporting events. Together, these activities form an integrated transition pathway linking ecological restoration with new industries. A green transition in coal-producing regions cannot end with mine industrial closure and ecological rehabilitation. It must also coordinate the redevelopment of vacant spaces, the cultivation of successor industries, and the protection of residents' livelihoods. Reusing industrial heritage and drawing on the local workforce can create jobs close to residents' homes, advancing ecological improvement, industrial renewal, livelihood enhancement, and sustainable community development together.