DYNAMICS OF OASIS LANDSCAPE IN INLAND SHULE RIVER BASIN IN ARID NORTHWEST CHINA

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Shule River basin is located in the west of Hexi Corridor, Gansu province, northwest China. It is an area with typical arid features and very fragile ecology. In this paper, the driving factors of landscape change and the resulting ecological and environmental problems caused by landscape change had been analyzed. The results can provide ecological security assessment and landscape planning for the study area. It will be very valuable for the sustainable development of the Shule River Basin.

Using the Landsat TM imagines of June in 1987 and August in 2003 as the digital sources, the vector and grid landscape maps of distributions of the Shule River Basin were derived. The dynamics variation of the landscape in that basin was got on the basis of the software of ArcGIS 9.0, and the forecast on the dynamic variation of landscapes in that basin was executed using the software of the Matlab 6.3. At the same time, the eco-environmental effects of landscape change had been analyzed.

The results showed that: ① In Shule River Basin, the farmland area had increased greatly from 1987 to 2003, the area of orchard, residential quarters and industrial and mining land, the Gobi, and Sandy desert increased slightly, and other kinds of landscapes have decreased in varying degrees, and the grassland has decreased greatly. During the period, the landscape pattern has an obvious trend of fragmentation, which indicated that human activities enhanced; ② The transfer matrix of landscapes change indicating that the increase of farmland mainly came from the grassland, and at the same time there was some farmland and grassland become residential quarters and industrial and mining land, the

Gobi and Sandy desert; ③ The Markov forecasting showed that under the condition of the same disturbs between 1987 and 2003, all the landuse types will increased but wetland, the Gobi and Sandy desert, the landscape compositions are irrational till the variation of the landscapes is stable; ④ The landscape change with the main feature of farmland area increasing led to a series of ecological environment problem, such as deterioration of water quality, natural vegetation decreasing, and the eco-environmental system deteriorating; ⑤ Human activities, specially in relation to water utilization and population increment, have gradual became the most active and dominant driving factors in the landscape change.

Key words: The Shule River Basin; Landscape dynamics variation; Markov matrix; Driving factors; Northwest China

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