

徐学选,刘普灵,据彤军,史新合,宇苗子.黄土丘陵区燕沟流域水土流失治理的水沙效应[J].农业工程学报,2012,28(3):113-117

黄土丘陵区燕沟流域水土流失治理的水沙效应

Effects of soil and water loss control on reducing runoff and sediment transport in Yan' gou watershed of Loess Hilly region

投稿时间: 2011-04-19 最后修改时间: 2011-10-12

中文关键词: [径流](#),[泥沙](#),[生态](#),[燕沟流域](#),[黄土丘陵区](#)

英文关键词: [runoff](#) [sediments](#) [ecology](#) [Yan' gou watershed](#) [loess hilly region](#)

基金项目:重点基础研究发展计划“中国主要水蚀区土壤侵蚀过程与调控研究2007CB407205”;中科院西部行动计划项目“黄土高原水土保持与可持续生态建设试验示范研究(KZCX2-XB2-05)”。

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中文摘要:

黄土高原大规模的生态恢复必将将对水土流失区的生态环境产生深刻影响,其流域尺度的水文效应对理解生态环境响应尤其重要。通过对延安燕沟流域1998—2010年的生态系统恢复进程及其流域水沙变化过程耦合分析表明:燕沟流域治理后径流泥沙发生了深刻变化,尽管流域总径流仍随降雨波动,但洪水径流显著减少,径流中泥沙含量迅速减少,总输沙进一步减少。这种变化趋势与流域进行的治理措施、治理阶段吻合;梯田、坝地等工程措施使得流域径流显著减少,林草植被恢复使得径流减少的同时,径流含沙率减少幅度更大。工程措施配以植被措施基本可以做到泥不出沟。因此,黄土丘陵区治理流域应该生物措施与工程措施并重,达到控制水土流失的目的。

英文摘要:

The large-scale ecological restoration will lead to significant effects on regional eco-environment in the loess plateau. Its effect on the watershed hydrology is particularly important to understand the ecological environment changes. The objective of this study was to understand the runoff and sediment changes after soil and water conservation measures had been used in Yan' gou watershed in the loess hilly region. The data of restoration process, sediment and runoff dynamic from 1998 to 2010 were analyzed. Results indicated that the runoff-sediment in Yan'gou watershed have had a significant change after management. Although the total runoff still fluctuated with precipitation, the flood flow, sediment load and total sediment discharge decreased significantly. This tendency was consistent with the stage and methods of management in this region. Terrance and other engineering measures sharply reduced the runoff, and ecological measures not only reduced the runoff, but also led to a large amount of reduction on sediment content. Thus, we should combine engineering and ecological measures, so as to effectively control the soil erosion in loess hilly region.

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