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专论与综述

植被与水土流失关系研究进展

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摘要 水土流失是世界性的环境问题之一，对人类社会可持续发展构成威胁，控制水土流失成为迫切需要，有许多水土流失控制措施，而生物措施尤其植被一直是人们研究的焦点。根据前人的研究，从斑块、坡面和流域/区域尺度总结了植被与水土流失的关系。斑块尺度植被对降雨和径流侵蚀能量具有很大的减弱或消除作用，可以改变植株底部的土壤性质，改善其结构，进而降低土壤可蚀性，增加入渗能力，从而减轻土壤侵蚀程度。不同植被类型、植被的不同层次结构，不同植被的形态结构具有不同的土壤侵蚀控制作用。坡面尺度主要从坡位、坡度、坡向对植被生长和分布格局的影响、对水土流失过程和格局的影响以及裸地－植被镶嵌格局、植被的条带格局对水土流失的影响和反映水土流失过程的景观格局指数的构建等方面进行了研究。更多是从植被恢复及其水土流失效应方面进行了探讨，为退化生态系统恢复和格局设计提供了极其有用的信息。流域/区域尺度植被与水土流失的关系更大程度上受到气候、地貌特征的影响，因此研究多从一定气候条件控制的土地覆盖（植被覆盖）及其格局的水土流失效应方面进行的。由于大尺度监测非常困难，研究多从遥感监测、GIS集成和模型模拟方面开展，是流域、区域等大尺度生态安全格局设计的有力支持。前人的研究为生态环境建设和保护提供了大量参考信息，但仍有一些问题需要进一步探讨，对此进行了初步的概括和归纳，希望能够对植被和水土流失关系的研究起到一定促进作用。

关键词 植被；水土流失；尺度

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Research review of the relationship between vegetation and soil loss

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Abstract Soil loss is one of the world's most critical environmental problems, and presents a key challenge to human sustainable development. So it is vital to understand how to control soil loss. There are many soil conservation measures, in which plant cover has been given special attention. According to previous research, the relationship between vegetation and soil loss was generalized through the three scales of patch, hillslope and watershed/region. At the patch scale, vegetation can greatly reduce or eliminate the energy from rainfall and runoff flow. It also can improve soil properties and soil structure under vegetation, and then decrease soil erodibility and increase infiltration capacity to reduce soil loss. In addition, vegetation types, vegetation structures and vegetation morphology also have direct influences on soil loss. At the hillslope scale, research has focused mainly on such aspects as the influence of slope position, slope degree and slope aspect on vegetation growth and distribution patterns. Other issues discussed include soil loss processes and patterns, influences of bare soil-vegetation mosaics and banded vegetation patterns on soil loss, and designing indices indicating runoff and soil loss processes and patterns. Most authors studied ve

getation restoration and its effects on soil loss, and provide much valuable information on degrade d ecosystem restoration and ecological security pattern design. At the watershed/region scale, th e relationship between vegetation and soil loss is mainly controlled by climate and geomorpholog y characteristics, thus most studies concentrate on aspects of land cover (vegetation cover) and it s effects on soil loss. Because of the difficulty in making observations at a large scale, remote sens ing monitoring, GIS integration and model simulation are the main subjects and they can greatly he lp design regional ecological security pattern. In general, the previous research provides a large qu antity of available knowledge for ecological conservation and environmental protection, howeve r, there still exist some deficiencies, which need much more investigation. These deficiencies are a nalyzed so as to make suggestions for future studies on the relationship between vegetation and so il loss.

Key words vegetation _ soil loss _ scale

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