

水里溪上游集水區土地利用與溪流水中硝酸鹽濃度關係之探討

葉春國^[1] 廖學誠^[2] 詹進發^[3] 黃正良^[4] 薛美莉^[5]

摘 要 本研究主要目的在於探討土地利用與溪流水中硝酸鹽濃度之關係，並以水里溪上游集水區作為探討對象。結果顯示，研究區溪流水的硝酸鹽濃度與流量呈正相關，隨著流量的增加而增加。研究區最主要的土地利用類型為林地，其次為檳榔園，再其次為建地及草地，研究區內的土地利用型態與當地農業發展的歷史變遷有關。此外，根據皮爾森相關係數分析後得知，研究區溪流中硝酸鹽濃度與農業土地利用面積比例呈正相關，尤其是濱水帶 25 m 及 50 m 內之檳榔園比例與溪流中硝酸鹽濃度關係最為顯著正向。由於研究區檳榔園大都緊鄰溪流兩側，為了避免上坡過多營養鹽隨著地表逕流或泥砂流入溪流中，本研究建議將溪流兩側 50 m 寬濱水帶設為森林保護帶，以攔截泥砂並過濾水質。此外，農業開墾位置及其施肥耕作方式亦應特別留意，如此將有助於未來集水區經營的永續發展。

關鍵詞：土地利用、硝酸鹽濃度、森林保護帶。

Relationship between Land Use and Nitrate Concentration of Streamwater in the Upper Shui-Li Creek Watershed

Chun-Kuo Yeh^[1] Shyue-Cherng Liaw^[2] Jih-Fa Jan^[3] Jeen-Lian Hwong^[4] Mei-Li Hsueh^[5]

ABSTRACT The purpose of this paper was to study the relationship between land use and nitrate concentration of streamwater in the upper Shiu-Li creek watershed. The results showed there was a positive relationship between the nitrate concentration of streamwater and stream discharge. The nitrate concentration increased with the increased discharge. The most dominant land use type in the study area was forestland, and the other following types were betel nut plantation, built site, and grassland, respectively. These land use types were closely related to the historic change of local agricultural development. In addition, based on Pearson correlation analysis, there was a positive relationship between the nitrate concentration of streamwater and proportion of agricultural land use areas. Especially, for riparian buffers with a width of 25 m and 50 m, the proportion of betel nut plantations and nitrate concentration of streamwater had a very significant

[1] 國立臺灣師範大學地理學系碩士

Master, Department of Geography, National Taiwan Normal University, Taipei 106, Taiwan, R.O.C.

[2] 國立臺灣師範大學地理學系副教授 (通訊作者)

Associate Professor, Department of Geography, National Taiwan Normal University, Taipei 106, Taiwan, R.O.C.
(Corresponding Author)

E-mail: liaw@cc.ntnu.edu.tw

[3] 國立政治大學地政系副教授

Associate Professor, Department of Land Economics, National Chenchi University, Taipei 116, Taiwan, R.O.C.

[4] 臺灣林業試驗所蓮華池研究中心主任

Chief of Lien-Hua-Chih Research Center, Taiwan Forestry Research Institute, Nantou 555, Taiwan, R.O.C.

[5] 臺灣特有生物研究保育中心副研究員

Associate Researcher, Taiwan Endemic Species Research Institute, Nantou 552, Taiwan, R.O.C.

positive correlation. Because most betel nut plantations were near the streamside we suggest establishing a forest protection strip with a width of 50 m around streams to reduce nutrients flowing into stream from upland brought by runoff and sediments. The forest protection strip can intercept sediments and filter water quality. Besides, we should pay attention to location selection of agricultural sites and practice methods of fertilization and cultivation. Therefore, sustainable development of watershed management could be carried out in the future.

Key Words: land use, nitrate concentration, forest protection strip.