

摘要

台灣地區河川中下游河段大多以辮狀河川為主，辮狀型河川河寬較寬且河身順直，水流多分岔，通常有兩股或兩股以上的流路。在縱向上，河谷的比降較陡，挾帶泥砂量較多，粒徑較大；在橫向上，主深槽有左右擺盪的特性，寬深比較大，沙洲面積小且數量多，河川型態容易改變，導致河川整體外形十分散亂。早期在對辮狀河川的整治多以兩岸的堤防為主，目的在於對主流流路的束縮以達到控制並減少災害發生的效果。

有鑒於河寬的變化會造成下游河川型態的改變，本研究即針對河道寬窄的變化進行室內渠槽實驗，透過改變河道的寬窄及不同的流量，觀察在下游的河道會有怎樣的發展與變化，探討主深槽擺盪、河床刷深與沙洲形狀及消長等問題，並整理出其大致的規律性。

結果發現實驗一開始流路散亂河中沙洲零星分佈，數量都不多，由於上游沒有來砂補充，主深槽會快速下切，中下游段因有上游來砂影響使深槽由下切轉為左右擺盪的現象。同流量下河寬漸寬時，主深槽形成時間隨之增加，主深槽擺盪週期漸大。同河寬下流量漸大時，河道展寬與下切速率增加，主深槽擺盪週期漸小。發現在給定條件下沙洲長寬經無因次後有一固定關係，當沙洲於此範圍內面積增加時，長度增加的量會大於寬度增加的量，沙洲外型變狹長。

關鍵詞：辮狀河川，渠槽實驗

Abstract

Midstream and downstream is mainly to braided rivers in Taiwan, these are always with large width and straight shape, waterway is bifurcation, usually have two or more than two-ways. In vertical section, the valley has a steep slope, and carry a lot of silt with large size, in cross section, the mainstream of braided river has swing character and larger width-depth ratio, the area of sand bar is small but numerous, the shape is easily been changed. These all make the shape of river look sprawl. In the past, dredge in the braided rivers is always on two sides of the dike, mainly aimed at the mainstream flow direction of the beam to shrink to control and reduce the effects of disasters.

In the light of the width changes will cause the changes of the river kind of downstream, this study is taking an in indoor flume test for the river width changes. Through the width of river changes, observed the downstream of the river will be how to change, discuss the issues of swinging mainstream, scouring river bed and growing sand bar, finally develop its rule generally.

The results showed that at the beginning of the experiment, the channel without mainstream and the sand bars spread sporadically, and has less number of sand bars. Due to there has no sand supply, the mainstream of upstream cut deeply and immediately. And the midstream and downstream is effected by sediment from upstream. So their mainstream change cutting into swinging. Under the same water quantity, as the channel width gets wider, it takes longer time to form a mainstream and the swinging cycle of mainstream gets longer. Under the same river width and water quantity gets bigger, the channel extension and rate of cutting will increase but the swinging cycle of mainstream gets shorter. As the result, the length and width of sand bar after dimensionless has a

regular formula. When sand bar increases within this area, the increasing length will be bigger than the increasing width. It looks narrow.

Key words: braided rivers, flume experiments