

Saroj Sechai 2014: Analysis of the Effects of Water Pushing by Horizontal Axis Propeller. Master of Engineering (Irrigation Engineering), Major Field: Irrigation Engineering, Department of Irrigation Engineering. Thesis Advisor: Mr. Chirakarn Sirivitmaitrie, Ph.D. 114 pages.

According to the major flooding in 2011, water pushing was one of solutions used to increase drainage discharge in rivers and canals. Many types of boats such as break-bulk carrier, naval ship and RID water pusher were used. This study aims to determine the effects by using a physical hydraulic model.

Experiments to study the phenomenon of pushing water in the hydraulics laboratory, the 8 cm. and 20 cm. diameters horizontal axis propellers were used for pushing water in an open channel section size width 30 cm. height 40 cm. and length 10 m. The experiment showed that at fixed flow rate when turn on the water pushing machine causes an increase of downstream water and flow in a short period. After getting into steady state, the decrease of downstream water back to the previous level occurred. At this state, it causes permanent drawdown, but discharge speed in the canal. On the other hand, if the canal has an increase of flow not only from sideward but also through itself, upstream drawdown will slightly decrease and downstream water will permanently rise up. In this case, water pushing will help increase flow speed in the canal. The result shows that increasing the number of blades is more efficient than increasing speed of blades rotation.

The middle or deeper position of blades in a canal section will make the water pushing more efficient and be able to use for flooding mitigation. The results of this study show efficient of various scenarios.

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Thesis Advisor's signature