Water is an essentially important natural resource for humanity life. The relation between water and land use were used to investigate the dry seasonal streamflow in the Upper Ping River Basin which is located in the Northern part of Thailand, covers an area of about 25,214 sq. km. The hydrological model namely Soil and Water Assessment Tool; SWAT is applied. The model simulation are divided into three case studies i.e., to investigate the dry seasonal streamflow of different situation land use in the past year-1990 and present year-2007 respectively, and to allocate land use in the future for increasing streamflow in dry season by restoration of watershed forests. For the land use allocation were splited into three land use plans as the first plan and second plan are allocated on the basis of criterion of watershed classification, and for the third plan is allocated basing on the policy and strategy of water resources development

In this study, the SWAT model were calibrated and validated with observed data from five hydrologic runoff stations by spliting into two periods i.e., from 2000 to 2003 for calibration and 2004 to 2007 for validation. The result of calibration indicates the coefficient of determination (R^2) varies from 0.53 to 0.64 and Nash-Sutcliffe efficiency coefficient (E_{ns}) ranges from 0.50 to 0.63, for the validation result, the R^2 varies from 0.53 to 0.67 and E_{ns} ranges from 0.53 to 0.66, and for the percentage of relative difference between simulated and observed daily streamflow is very little difference between 0.77% to 4.48%. These results assure that, the set of model parameter calibration are suitable for the studied in watershed area, and can be applied in this study.

The result indicates that i) The present land use of the forest land was decreased at about 4.04%, on the other hand, the agricultural land, disturbed forest and urban area were increased by 3.11%, 1.23%, and 0.55%, respectively. Besides, the dry seasonal streamflow in present land use has decreased at about 112.84 million cubic meters (MCM) or decreased 5.37% when compared to past land use. This leads to conclude that, when the forest area decline the streamflow in dry season has been also decreasing. ii) Regarding to land use allocation in the future, the forest land of first plan, second plan, and third plan in which is given to increase by 5.56%, 9.52% and 3.45%, respectively comparing to present land use. The simulated results indicate that, the dry seasonal streamflow of land use allocation in the first plan, second plan, and third plan are 2,023.39 MCM, 2,021.75 MCM, and 2,029.89 MCM, respectively. All of land use allocation plans can be enhance the streamflow in dry season, and the suitability land use allocation plan for the future in the Upper Ping River Basin is the third plan that increases streamflow in dry season of about 40.58 MCM when compare to dry seasonal streamflow in the present land use. The optimal land use allocation in the Upper Ping River Basin should be in the proportion of forest land, agricultural land, urban area, water resource and other at 75.64 : 13.11 : 2.28 : 0.80 : 8.16 percents, respectively.

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