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PARTICIPATORY APPROARCH IN ADAPTIVE WATER MANAGEMENT AND RURAL DISASTER PLANNING BY IRRIGATION GATE OPERATION

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Taking the Nam Cheng River basin as an instance of flood-prone areas during rainy seasons, the relation between irrigation gates management specifically for water supply during dry seasons and floods during water-rich seasons is examined by modeling runoff, flooding processes and gate operations through the DWCM-AgWU Model (a Distributed Water Circulation Model incorporating Agricultural Water Use). In particular, technological transfer stages in trials there lead to the products of adaptive water management and rural disaster planning evoking local managers of irrigation facility control and relevant farmers and inhabitants.

The target basin (457 km^2) covers one of the tributary in the Nam Ngum River system and low-lying paddies extends where the Chim and Ping Rivers join and annually repeated floods occur. Irrigation gates are situated at the end of the river basin to secure water for rice cultivation during dry seasons. In addition, they have the function to prevent the reverse flow from the Nam Ngum River, but they eventually have caused frequent floods in low-lying areas. This direction was obtained by the analyses; namely, 1) stage of field surveys and a model development, 2) Specification stage of flood causes, 3) Introduction stage of new observation facilities and modified gate operations, 4) Development stage of flood prevention guidelines. As a result, the utilization of models turns out to be very effective means for several analyses in areas with the lack of fundamental data as shown in the target area, in that the estimated values through the models would be utilized as quasi-observation data, such as temporal and spatial estimates of river discharges and water levels.

In conclusion, based on our studies progress of the 4 years term, due in part to our 7 visits to the site and 4 seminars, the proposals for adaptive water management and rural disaster planning resulted in mutually ones deepened by local managers as well as experts, not a one-sided technological transfer just from experts.

Keywords: DWCM-AgWU model, Irrigation gate, Adaptive water management

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