A preliminary study for water and substances simulation modeling in Cordilleras terraced paddy fields, Philippines

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In the northern part of Luzon island of the Philippines, the Cordillera terraced paddy fields were registered as a World Heritage site in 1995, and cultivation of paddy rice has been carried out for many years. However, in recent years, maintenance and management of rice paddy fields have become difficult due to lack of personnel and shortage of budget. In addition, some farmers complain about a declining rice yield year by year. In this research, we study methods for stabilizing of crop production, through managing agricultural activities such as irrigation and fertilizer applications, with consideration of environmental conservation. We selected Bangaan village within the Cordillera rice paddy area, and will analyze water and substances dynamics by a simulation model. As results of our preliminary survey, the target area had approximately 11 ha of paddy fields, and the water catchment area flowing into the uppermost paddy field had almost the same area size. Also, using ASTER GDEM, the average slope in the east-west direction was calculated and found to be steep as about 20%. Furthermore, the paddy fields were traced as accurately as possible using the satellite image, and found that more than 130 paddy fields were existed. The largest paddy field in the area was roughly 0.3 ha, with smaller rice paddy fields occupying the majority. As next, we are going to understand the transfer of irrigation water and substances, especially between paddy fields, for modeling analyses.

Keywords: Terraced paddy fields, Irrigation, Agricultural activities, Philippines

