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[\[PDF \(387K\)\]](#) [\[References\]](#) [\[Supplementary Materials\]](#)**CO<sub>2</sub> and H<sub>2</sub>O Fluxes Ratio in Paddy Fields of Thailand and Japan**[Tiwa Pakoktom](#)<sup>1)</sup>, [Masatoshi Aoki](#)<sup>1)</sup>, [Poonpipope Kasemsap](#)<sup>2)</sup>, [Samakkee Boonyawat](#)<sup>3)</sup>  
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**Abstract:**

Measurements of CO<sub>2</sub> flux (FCO<sub>2</sub>) and H<sub>2</sub>O flux (FH<sub>2</sub>O) were carried out on paddy fields of Thailand and Japan during the 2004, 2005 and 2006 growing seasons using the Bowen ratio technique. The objective was to determine the water resource requirement to achieve a certain amount of CO<sub>2</sub> assimilation per land area and analyze the ratio between FCO<sub>2</sub> and FH<sub>2</sub>O ( $CWFR = FCO_2 / FH_2O$ ). The relationship between FCO<sub>2</sub> and FH<sub>2</sub>O was investigated using regression analysis in 4 growing stages. Relatively high correlations ( $r^2 = 0.56-0.96$ ,  $p < 0.01$ ) between FCO<sub>2</sub> and FH<sub>2</sub>O were found when data were grouped by growing stage. Using daytime average data, there was high correlation ( $r^2 = 0.61-0.94$ ,  $p < 0.01$ ) between daytime average  $CWFR$  ( $CWFR_d$ ) and daytime average vapor pressure deficit ( $VPD_d$ ) in paddy fields of Japan and Thailand for each growing stage. Pooled data from Thailand and Japan showed high correlations ( $r^2 = 0.61-0.94$ ,  $p < 0.01$ ) between  $CWFR_d$  and  $VPD_d$  for each growing stage. The developed regression equation was tested using an independent published dataset, and it was found that the estimation error was only 2.7%. The regression equations will be useful for estimating  $CWFR_d$  by only  $VPD_d$  and

accordingly for assessing the water resource requirement.

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