MODULATION OF THE PHILIPPINE SOUTHWEST MONSOON BY INTRASEASONAL OSCILLATIONS AND INDIAN SUMMER MONSOON TELECONNECTIONS

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ABSTRACT

The intraseasonal variability of SWM is known to be modulated by intraseasonal oscillations such as the MJO and BSISO, but the influence of teleconnections from other monsoon regions is understudied. Thus, this study investigated the modulation of SWM by the Madden-Julian oscillation (MJO), boreal summer intraseasonal oscillation (BSISO), and teleconnections with the Indian summer monsoon (ISM). Correlation and regression analyses performed on select DOST-PAGASA station rainfall from western Philippines and the All-India Rainfall dataset reveal weak coupling between ISM and SWM at interannual timescales ($|r| \leq 0.282$), with ISM variability explaining only about 10% of SWM rainfall variability. However, statistically significant relationships emerge during peak monsoon months (July–August) particularly over eastern and northeastern India, indicating a tendency for enhanced ISM activity to coincide with suppressed SWM rainfall, consistent with a monsoon "seesaw" mechanism. Likewise, the same methods were applied to evaluate the relationship between MJO and BSISO, as represented by the bimodal ISO index, and SWM, as represented by the Local Southwest Monsoon Index (LSWMI). Correlation and regression analyses revealed that LSWMI has weak correlations with MJO ($r \leq -0.041$) and stronger correlations with BSISO ($r = 0.263$), indicating that SWM rainfall responds better with BSISO and highlighting it as the dominant "summer" mode of the tropical intraseasonal oscillation. These insights contribute to improved understanding of monsoon interactions and have implications for enhanced monitoring and prediction of SWM rainfall.

Keywords: *Philippine southwest monsoon, Local Southwest Monsoon Index, MJO, BSISO, Indian summer monsoon, All-India Rainfall Index*