**Abstract**

  This paper presents systematic determination of optimal conditions for fluidized bed paddy drying and adaptive fuzzy logic control in order to guarantee good quality and consume energy efficiently. In this study, paddy moisture content and drying air-heating load are used as parameter indices to quantify rice quality and energy consumption respectively. The performance index of the fluidized bed system is then defined as the summation of square errors between those actual parameter indices and the desire values. This performance index is minimized in real time by a gradient-based method to yield optimal conditions that are used as the desired reference for a process controller. An adaptive Fuzzy Logic Controller (FLC) is proposed to control the system conditions closed to the reference values. Case studies of fluidized bed paddy dryer were undertaken for the viability of the proposed methodology. The results show that the proposed method can be efficiently implemented in the real-time determination and control the optimal conditions for fluidized bed paddy drying system that maintains paddy moisture content closed to the desire level with efficient energy consumption.