ABSTRACT—In this paper, we propose a constructive method to develop a fuzzy system having a monotonic input–output relationship and prove that the developed fuzzy system can approximate any continuously differentiable monotonic function with any desired degree of accuracy. The fuzzy system is constructed with complete and consistent input membership functions and imposes special parametric constraints on the consequent part of the fuzzy rules. The monotonicity property and approximation capability of the developed fuzzy system are demonstrated using numerical examples.